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AMERICAN PRINTING HOUSE
FOR THE BLIND, INC.

Department of Educational and
Technical Research

Report of Research and Development Activities

Fiscal 1992

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Mission

The American Printing House for the Blind promotes independence of blind persons by providing special media, tools, and materials needed for education and life.

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The Department of Educational and Technical Research of the American Printing House for the Blind (APH) plays a critical role in enabling APH to address its mission, which is to promote independence of blind persons by providing special media, tools, and materials needed for education and life. This is done through the identification and development of special materials and tools needed by APH's educational market while simultaneously looking to the needs of its adult consumers. The Department works to develop new and timely products, not available elsewhere, with the goal of meeting the unique needs of APH's customers/consumers.

Currently, overall priorities for APH's research program are influenced by the priorities set by the U.S. Department of Education's Office of Special Education and Rehabilitation Services, by Congressional Appropriations Committees, by sales of existing product lines, by results of surveys and needs meetings of customers/consumers, and by both APH's staff and its Educational Research and Development Committee in response to observed, general needs of the field. Primary areas being addressed during FY 1992 included early childhood, multihandicapped, low vision, braille, educational measures, and microcomputer applications. For future planning, it is important to look ahead at the nation's six education goals that are the basis for the "AMERICA 2000" plan to reform education in order to determine what affect they may have on the legally blind population served by APH. These goals are that by the year 2000:

1. All children in America will start school ready to learn.

2. The high school graduation rate will increase to at least 90%.

3. American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography.

4. U.S. students will be first in the world in science and mathematics.

5. Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

6. Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

The agenda of APH's October 1992 Annual Meeting will provide a forum for open discussion of these goals and what can be anticipated in the schools of tomorrow as the nation strives to improve the education of its citizens. The implications of this initiative for persons who are blind and visually impaired will influence the priorities of APH's research and development program.

This report contains a description of activities that were underway during FY 1992 and that are planned for FY 1993 by APH's Department of Educational and Technical Research. For each, the purpose of the project is stated, the primary project staff is identified, a little background of the project is provided, work accomplished during FY 1992 is briefly summarized, and work that is planned for FY 1993 indicated. More complete information about all of the projects is available upon request.

The continuing success of APH's research program is a resounding testimonial to the splendid cooperation afforded its research staff by administrators, professionals working in the field, and blind students/clients and their parents who participate in its work. In addition, it reflects positively the full cooperation of APH's staff and employees. Without such cooperation it would not be possible to maintain such a high level of productivity.

Early Childhood

On the Way to Literacy II (previously Supplement to On the Way to Literacy: Early Experiences for Young Visually Impaired Children) (new)

Purpose: To provide additional tactile/visual storybooks for young visually impaired preschoolers using formats developed in the previous project, On the Way to Literacy

Project staff: Suzette Wright, Project Director
Tom Poppe, Model and Pattern Maker

Background. During the evaluation of the On the Way to Literacy materials, evaluators requested that additional tactile/visual storybooks be developed, particularly storybooks featuring real objects and thermoformed replicas of real objects. Students were assessed as being most interested in the real object and thermoformed storybooks, although each book was mentioned by one or more students as his/her favorite. The range of types of tactile graphics used in the storybooks was approved.

In March 1991, the desire for additional read-aloud books featuring braille and print and tactile/visual illustrations was repeated by members of the Braille Needs Assessment Committee. More storybooks featuring thermoforms of real objects and books corresponding to those used by young sighted children were requested by the group, who prioritized this as the first need under the area of materials to be developed. Overall, materials development was prioritized as the third of four areas of need, following assessment and organizational skills.

To address the need for additional tactile/visual storybooks for young visually impaired children, a second project of more limited scope was initiated in June of 1991. Additional books designed to be read to a child by an adult reader will be created, or project staff will design adaptations of commercially available children's books.

Like the first set of tactile/visual storybooks, additional books will display braille and print text, providing exposure to the written word for both blind and low vision children and an appropriate medium for the adult reader, whether blind or sighted. Tactile and visual illustrations will be designed according to criteria established for the first set of tactile/visual storybooks; these criteria were based on tactile graphic research contained in the literature.

Review of existing children's books has revealed some stories suitable for translation. In these cases, the story's text will be preserved and published in braille and print along with tactile graphics designed by project staff. Such translated books will be completely produced at APH.

In addition, work on several original storybooks was begun by project staff.

Work during FY 1992. An examination of storybooks published for young sighted children was begun in July and continued through September. Recently published children's stories were reviewed; library collections of children's classics and books recommended in book lists were examined in an effort to find stories which would lend themselves to tactile illustration. In addition, work on several original storybooks was begun by project staff. Only a limited number of tactile/visual storybooks were being developed, therefore an effort was made to select stories of high quality with lasting appeal. In a meeting in July, Josephine Stratton, Project Consultant, provided copies of four published storybooks suitable for tactile illustration and reviewed three original stories created for the project.

Altogether 11 stories (10 published, 1 original) were selected; project staff sketched or specified in writing the tactile illustrations proposed for each book. Photocopies of the illustrated text for the storybooks were mailed to three consultants for assistance in selecting the best to be developed into prototypes and evaluated with children. A questionnaire was devised and given to consultants asking them to rate and rank the proposed storybooks according to their suitability for tactile illustration and appeal for young visually impaired children. Their suggestions for improvements to the storybooks were also gathered.

After analyzing the results of the questionnaire, five storybooks were chosen for further development. Four of these were rated and ranked highly by at least two of the three consultants; they were rated moderately highly by the third consultant. The fifth storybook was ranked and rated moderately highly by all three consultants. Once the books were selected, work began with the research staff model maker. Project staff obtained materials necessary to construct the prototypes. Thermoform molds were made for one of the books. Two of the books used fabric textures. Copies of the stories' texts were given to the braille department for translation. Two of the books employed raised line graphics, which were designed, drawn, and embossed. Once braille copies of the books were pressed, the large print text was stripped in by hand. Visual graphics were drawn and colored by hand; thermoformed images and pages with illustrations using textured fabric were completed. The prototypes were collated and bound.

A questionnaire concerning the storybooks and a child data sheet collecting information about students' apparent interest in the books were developed.

Questionnaires and storybooks were mailed to five sites for evaluation during April and May. Nine teachers and six parents used the storybooks with approximately 37 students during this period. Questionnaires were returned June 15th and results began to be compiled for analysis.

Work planned for FY 1993. Results of the field evaluation will be analyzed. Josephine Stratton will review the five storybooks using the evaluation forms provided to teachers during the field evaluation as a guideline for her review. Revisions will be made to the storybooks as indicated. They will be submitted for production approval in October 1992.

Infant Skills Project (continuing)

Purpose: To develop a collection of tangible child-use materials targeted for infants and toddlers, birth-24 months, and to develop accompanying written material useful by parents and teachers in developing critical skills in young children

Project staff: Sheri Moore, Project Director
Tobey Burton, Project Assistant

Background. The most recent Early Childhood Materials Needs Assessment meeting developed recommendations for specific early childhood educational materials research and development projects. The committee delineated and set priorities in several areas, with the Infant Skills project receiving a high priority rating. This high priority correlates with the emphasis at the federal level to initiate and strengthen infant/toddler programs throughout the United States under PL 99-457 and extended under PL 101-476.

Work during FY 1992. Project staff have worked on determining all of the materials and various components to be included in the Infant Skills Project materials for a comprehensive field evaluation. After the tangible materials were finalized, accompanying detailed activities and teacher guidelines were written. This component, which details instructions for teachers, includes numerous recommendations for positioning the young child for optimal learning. These suggestions should be particularly useful in working with young children with multiple impairments. Multiple sets of the tangible materials were sourced and collected in preparation for the field evaluation. A number of the materials were refined and revised that are developed and designed by Printing House staff. A second resource/support guide, the Parent Early Childhood Education Series developed by the early childhood staff of the Overbrook School for the Blind, will also be included. This series, described more comprehensively in a separate project report, entitled "Parent Early Childhood Education Series," was evaluated extensively by a number of experts in the area of early childhood vision. This series will also be offered for separate sale, without the accompanying Infant Skills materials.

Sites were identified, through the Early Childhood data base, to be contacted regarding participation in the Infant Skills Project field evaluation. Staff made numerous contacts with potential field evaluators to select those most appropriate for use in the field evaluation. Field evaluation of the Infant Skills materials began June 1, 1992. An evaluation form was designed to determine the usefulness of each of the Infant Skills materials.

Work planned for FY 1993. Throughout the evaluation, staff will keep in contact with and monitor field evaluation sites. Field evaluation data will be posted and checked. An analysis will be made of these data, and revisions to the tangible materials as well as to the accompanying activities, will be determined. Staff will implement all revisions. Following final testing and any necessary revisions, all materials will be readied for introduction into the production pipeline. Production documents will be prepared and project staff will meet on a regular basis with production personnel. Project personnel will submit all tangible materials to U.S. Testing Company for safety evaluation. A final report will be written, detailing all aspects of project development.

Parent Early Childhood Education Series (continuing)

Purpose: To evaluate and revise a set of written materials useful in developing critical skills in young visually impaired children, targeted for parents and teachers

Project staff: Sheri Moore, Project Director
Bernadette Kappen, Project Author and Codirector

Background. There is a documented need for specific training materials for parents and teachers of young blind and visually impaired children. Too often, parents are overwhelmed by a long booklet or book covering an array of topics. Experienced teachers of infant and preschool blind children developed the Parent Early Childhood Education series to provide concrete and discrete information in a variety of topical areas. The topical areas selected include those proven to be important to parents and experienced teachers working with young children with visual disabilities.

Work during FY 1992. Following the field evaluation of the Parent Early Childhood Education Series, the project director worked closely with Dr. Bernadette Kappan and her staff at the Overbrook School for the Blind in coordinating and determining final revisions to the Parent Early Childhood Series.

Some of the illustrations have been redrawn to put them all into a standard style. Revisions are being made via desktop publishing and have been coordinated jointly by project directors at APH and Overbrook School for the Blind. Collaborative decisions have also been made in such areas as cover design, production format, packaging choices, etc. Components of the program include:

General suggestions for infants with visual impairments
General suggestions for the multiply impaired young child
Terminology--words relating to vision impairment
Developing eating skills, including general suggestions, spoonfeeding, cup drinking
Promoting orientation and mobility skills
Tactile stimulation activities
Sensory development activities
Developing vision skills
Selecting equipment and toys
Developing refine motor skills
Positioning and movement
Cognitive development
Siblings and suggestions for family life
Developing listening skills
Parent-child interactions

Developing language and communication
Developing social skills
Early parent-child interaction
Socialization
Stereotypic mannerisms--prevention and extinction

Each component includes 1-2 pages of information of that specific topical area.

Work planned for FY 1993. Following all final revisions and a final editing, a production document will be developed prior to initiation into the production pipeline. Project staff will continue to coordinate all project activities and decisions with the Overbrook staff. Prior to the production phase, the Parent Early Childhood Education materials will be translated into two additional formats: braille and Spanish. The Printing House is collaborating with a Spanish translator at The Foundation for the Junior Blind in Los Angeles, California for the Spanish version. Additionally, project staff will monitor all phases of the production process with the APH Production Department.

Preschool Learning Activities (continuing)

Purpose: To develop an instructional manual of functional/practical learning activities, appropriate for blind and visually impaired preschoolers, age 3-, 4-, and 5-years old

Project staff: Sheri Moore, Project Director
Tobey Burton, Project Assistant
Tom Poppe, Model and Pattern Maker

Background. APH has initiated the development of a continuum of educational materials for the 3-, 4-, 5-, and 6-year old age group. This is particularly timely, with many additional preschoolers being served through PL 99-457 and its extension PL 101-476. This specific project involves a manual of functional, varied, and numerous learning activities, specifically designed to make use of common objects in the development of a continuum of sensory skills and important concepts. Activities are designed to address skills that often require a great deal of practice, such as squeezing, pouring, sorting, categorizing, classifying, sequencing, and so on. The activities make use of environmental materials such as sponges, buttons, nuts, rocks, pennies, silverware, basters, water, marbles, magnets, beads, golf tees, cotton balls, and clothespins. Special consideration is given in the manual to learning experiences beneficial to young visually impaired children. In addition, all learning activities are also designed to foster integration experiences with sighted peers. To facilitate these experiences, a strong visual adaptations section is included with each activity.

Work during FY 1992. Final revisions were made to the activities included in the manual, Hands On: Functional Activities of Teaching Basic Skills and Concepts to Visually Disabled Preschoolers. This extensive manual, numbering some 165 pages, is organized for providing ready access to a wide array of appropriate activities for visually impaired and blind preschool level children. Major components of the manual include: Introduction; Activity Section, including subsections of preliminary activities, dry transfer, wet transfer, stringing, folding, clipping, twisting, sorting, care of person, care of the environment, food preparation, work bench activities, art, and grace and courtesy; Ideas for parents/home activities; and Appendixes of hard-to-find items, suggestions for further reading, and references/resources. Additional material was also added to the appendixes and the References/Resources sections.

Project staff prepared a production document and then conducted a meeting to turn over the project materials to production staff. The model maker has prepared the production

models for the tangible molded ABS plastic trays, specifically designed to facilitate the various activities included in the manual. The trays were evaluated by U.S. Testing Company.

Work planned for FY 1993. Project staff will write a final report detailing all aspects of project development. The Hands On manual and related materials will be available by summer 1993 from APH.

Early Childhood References and Resources and Low Vision References and Resources (continuing)

Purpose: To research recent literature relevant to young blind and visually impaired children and to develop a resource list of such references; to research recent literature relevant to working with low vision individuals and to develop a resource list of such references

Project staff: Sheri Moore, Project Director

Background. A selected bibliography of recent early childhood vision literature was prepared for the Printing House's 1987 Annual Meeting of ex officio trustees. At the same time, several other early childhood special education resource listings were also compiled and distributed including: professional journals, curricula, general references, and assessment tools. These resource materials have continued to generate considerable interest and requests from vision professionals.

Work during FY 1992. An updated listing of references and resources was made available for the APH annual meeting in October 1991. It was widely requested. Two separate references and resources lists were compiled: one related to early childhood and one related to low vision. The references and resources lists continue to be made available at no charge to those requesting the lists via mail or phone as a service from the Printing House.

Work planned for FY 1993. Project staff will continue updating both reference/resource lists on a semi-annual basis, provided that they continue to be requested by our consumers.

Multihandicapped

Making Picture Recipes (continuing)

Purpose: To evaluate a manual demonstrating how to make and implement a picture recipe system with nonreading multihandicapped low vision students

Project staff: Sheri Moore, Project Director
Tobey Burton, Project Codirector
Mary Zatta, Project Author
Diane Furino-Bleier, Project Author

Background. The purpose of the Picture Recipe program is to provide a means of developing functional living skills and cooking independence for the low language students who are non or beginning readers. This curriculum originated from needs within The Perkins School for the Blind. Teachers found that as the students became adolescents, daily living skills instruction and preparation for future placements into community living warranted the presentation of cooking instruction. There was no formal curriculum available to address the needs of adolescent students who were non and/or beginning readers. It was this situation which prompted the development of this picture recipe cooking program by two teachers working with deaf-blind/multihandicapped students at Perkins School for the Blind.

Work during FY 1992. The picture recipe program is designed to assist in developing cooking independence for students with low vision who are nonreaders or beginning readers. The materials were developed and initially evaluated by teachers at Perkins School for the Blind. The program includes a manual with easy, how-to directions; sample recipes formatted in two different ways; corresponding checklists for assessment; and helpful hints for adaptations. Also included is a master set of reproducible picture cards with which to make recipes. The master set of picture cards is organized in the following categories: food items, utensils, processes, appliances, miscellaneous. Project staff have reviewed the program and have worked with the authors in refining the materials and preparing them for field trial. A group of professionals to provide an expert review of the materials were identified. Reviewers were contacted; evaluation materials were prepared and distributed to the field testers and content reviewers. An expert review by professionals was conducted. The data were analyzed and were used to make revisions and modifications to the picture recipe materials. Based on the data from the field trial, a number of additional picture cards were identified. These cards will be added to the existing set and will make the materials more useful. APH has contracted with an artist to draw these additional pictures for the Making Picture Recipes program. Project staff are presently in the process of identifying pictures for the artist to draw to add to the usefulness of the picture recipe system.

Work planned for FY 1993. Project staff will work with the authors to prepare the revised and expanded materials for field trial. Work has begun on designing additional materials that will be included in the field evaluation version, particularly the inclusion of additional picture symbols and recipes. During this field evaluation, the materials will be used by both teachers and students with multiple disabilities. Project staff will develop an evaluation plan that facilitates the evaluation of the Making Picture Recipe program. The results of the evaluation will be compiled and analyzed to determine program modifications and revisions.

Multihandicapped Adolescent Project (continuing)

Purposes: To develop a manual of functional and community-based learning activities designed to meet the needs of adolescent multihandicapped visually impaired students, and to develop and evaluate several tangible materials useful in fostering independent functioning in adolescent multihandicapped students

Project staff: Sheri Moore, Project Director
Martha Majors, Project Codirector
Mary Zatta, Project Codirector

Background. The Multihandicapped Adolescent Project is targeted for students who have achieved basic skill levels and are involved in an educational program emphasizing self-care, independence, and life/community living skills. Written activities include functional and age-appropriate applications, stressing skills useful in a community-based setting. Applications of functional academics are also incorporated into project activities.

Work during FY 1992. The project director has worked in collaboration with several teachers of multihandicapped visually impaired students and teachers of deaf-blind students at Perkins School for the Blind. These teachers have formatively evaluated and reviewed the project materials, over the course of a school year. They have used the suggested activities in their classrooms, and have developed additional "teacher tested" activities for inclusion in the Multihandicapped Adolescent Project materials. Perkins' teachers have continued to refine the activities through using them in their classrooms. The project director has continued to work closely with Martha Majors and Mary Zatta, who are coordinating the contributions of the Perkins' staff. Perkins School for the Blind provided planning final release time for the teachers to participate in reviewing/revising the materials.

Activities cover a wide array of practical, functional program areas, and stress the importance of developing independence, self-sufficiency, functional skills, and community living/life skills. Various curricular areas have skills imbedded within the major components, such as communication skills, functional math skills, etc. The format for the presentation of the activities has been redesigned, with the objective of presenting information in a more concise and useful format. The revised format includes an overall rationale for using a functional curriculum, with an emphasis on practical activities that help students to generalize information. A main curricular area, such as community experience, is detailed, along with subtopics and specific activity suggestions. For each of

these subtopical areas, further activity suggestions are given in areas such as functional reading and math; manipulative experiences; group/socialization applications; language/communication; sensory experiences; and extensions in areas such as cooking, art, music, and dramatic play.

Work planned for FY 1993. The complete set of materials comprising the Multihandicapped Adolescent Project will be field evaluated. Staff will work to make contacts with appropriate programs, and will secure any needed permissions to participate. Project personnel will also construct an evaluation that will comprehensively address all aspects of the materials to be tested with the Multihandicapped Adolescent Project. Project staff will prepare materials needed for field evaluation and will also keep abreast with evaluators during the field trial period.

Data from the evaluation will be posted, analyzed, and revisions will be determined. Preparations will then be made for the writing of a production document for use with first production run of these materials. Staff will continue to monitor the project through the production phases, and will also complete a final project report.

Pragmatic Classroom Units for Young Multihandicapped Children (continuing)

Purpose: To evaluate a curriculum model, presented in a classroom units/thematic units format, that assists teachers of young multihandicapped visually impaired children in developing a methodology and practical approach to teaching, with a particular emphasis on the development of communication

Project staff: Sheri Moore, Project Director
Wendy Drezek, Project Author and Codirector

Background. The Pragmatic Classroom Units were developed by Dr. Wendy Drezek to accompany a curriculum model based on the work of Ellyn Lucas-Arwood. Pragmatism is a methodology for facilitating communication for children with language disorders. In this model, language has a social and cognitive base, and is shaped by consequences in the environment; language is only successful insofar as it results in the intended change in the environment. In the classroom, routines are used to structure a common meaning, units are used to introduce new concepts and vocabulary, and "boobytrapping" is used to force the need to communicate. Sign language and other nonvocal techniques are used with nonvocal and echolalic students.

Work during FY 1992. The Pragmatic Classroom Units were developed by Dr. Wendy Drezek for the purpose of facilitating communication strategies for young children with multiple impairments. Developing a communication system is a critical need of many students who are multiply impaired. Teaching activities are in a unit format and include content and extension activities for individual lessons. The units can be used in several ways. The pages can be reproduced and sent home to parents to structure home carry-over. The skills/concepts/vocabulary portion can be used to monitor progress and achievement. Skills, concepts, and vocabulary appear in multiple units. The initial appearance of the skills, concepts, and vocabulary are typically at a very concrete level with a later occurrence at a more abstract level. The purpose of the units is to present skills/concepts/vocabulary in a rich context of real objects and actions, rather than as isolated splinter skills. Lists of sample units include: school, me, leaves, mask, hat, bag, candy, pumpkin, corn, potato, apple, cranberry, turkey, cookie, present, tree, fruit, vegetable, bread, drinks, snacks, dessert, shape, valentine, spring, egg, animals, bathroom, kitchen, tools/household objects, music, toys, art, books, texture/touch, size/measure, space/time, color/shape, letters, numbers, community helpers/vehicles, community activities, summer, weather, dinosaurs, dragons and monsters, stories.

The materials were reviewed by Printing House staff and prepared for expert/content review. Evaluators were contacted; the Pragmatic Classroom Unit materials were prepared for review by several content/expert reviewers. Evaluation forms were developed for use by the content/expert reviewers, and included a variety of questions related to the value and usefulness of the Pragmatic Classroom Unit materials. Evaluative data were compiled and analyzed, based on the evaluative information provided by the content/expert reviewers.

Work planned for FY 1993. The project leader will meet with the author to discuss programmatic revisions, based on the field evaluation. The revisions will be made by the author and the project leader. Following these modifications, complete preparation will be made to prepare the materials for a field evaluation with teachers of young children with multiple impairments. The teachers participating in the field evaluation will provide information as to the appropriateness of usefulness/values of the materials for the learners with whom they work.

Low Vision

Assessment Program and Intervention Guidelines for Visually Impaired Children (continuing)

Purpose: To evaluate the University of California Berkeley (U.C. Berkeley) Assessment Scales for Visually Impaired Children, and to determine their applicability for use with teachers of young visually impaired children

Project staff: Sheri Moore, Project Director
Amanda Hall, Project Author and Codirector
Linda Kekelis, Project Author

Background. The U.C. Berkeley Assessment Scales for Visually Impaired Children were developed under a grant from the California State Department of Education. The overall goal of this project was to refine the scales through pilot-testing with a small number of blind and low vision children in the San Francisco Bay Area. The scales examine developmental milestones of particular importance to children with vision loss between birth and 2 years of age. For this project, (a) the scales were pilot-tested with 12 infants on the register of the Variety Club Blind Babies Foundation, (b) test items were refined for each of the scales, (c) a record-keeping system was developed for the scales, (d) preliminary developmental data for visually impaired infants between birth and 2 years were collected, and (e) inter-rater reliability for scoring of the scales was determined.

Work during FY 1992. The Assessment Program and Intervention Guidelines examine developmental milestones of particular importance to children with vision loss between birth and 2 years of age. The guidelines address the following domains:

social/emotional development
language development
cognitive development
gross motor development
functional vision
home environment

The Assessment Scales for Visually Impaired Children, along with the accompanying guidelines component, were reviewed by APH project staff. The Assessment Scales and Guidelines were submitted to APH from the field for consideration for publication by the authors. The program and guidelines were then prepared for review by several expert/content reviewers. Expert/content reviewers were contacted and their role in the project was explained. Materials were prepared and sent to professionals who agreed to be expert/content reviewers. Project staff stayed in

contact with the reviewers throughout the evaluation process. Printing House staff developed an evaluation plan to collect and analyze these data.

Work planned for FY 1993. Data will be assembled, posted, checked, and analyzed. An analysis of these data will determine future project directions. All activities, as well as decisions concerning the project, will be coordinated with the two project authors.

Potential Assessment of Visual Efficiency (continuing)

Purpose: To develop an assessment instrument useful in evaluating the potential for visual efficiency of young children and young children with multiple impairments, in addition to a visual disability

Project staff: Sheri Moore, Project Codirector
M. Beth Langley, Project Author and Project Codirector

Background. M. Beth Langley, author of the Functional Vision Inventory, has developed an instrument specifically designed to measure visual potential for visual efficiency in visually impaired multiply handicapped children. This new instrument is entitled the Potential Assessment of Visual Efficiency.

Work during FY 1992. The project author has worked on enhancing the format of the Potential Assessment of Visual Efficiency to make it both easier to administer and easier to rate.

The major components of the assessment are as follows:

- Demographics
- Physical readiness
- Medication
- Time of assessment
- Seizure activity during assessment
- Reaction to handling
- Posture and movement
- Structural status
- Vision structure and function
- Orientation and mobility
- Functional use
- Physiological status
- Visual behaviors
- Gaze
- Eye movements
- Visual fields
- Cortical visual impairments status
- Acuity
- Levels of stimuli and responses
- Stimuli processed
- Response patterns
- Visual perception
- Summary and impressions
- Current level of Visual functioning
- Visual variables
- Skills to be developed and/or refined

In addition, directions for administering the assessment instrument were developed. These directions are very detailed and comprehensive. The directions for the Potential Assessment of Visual Efficiency are similar to those typically found in normed assessment instruments. Also, significant revisions were made to the instrument, based on the results of the formative field evaluation. An additional component has been added to the assessment instrument. A screening instrument has been developed

which can be used to reduce total administration time, by determining a child's potential for developing visual efficiency in the review or screening format. The screening instrument summarizes the child's performance on sample or probe areas of the longer or complete assessment.

Consideration has been given to the advantages and disadvantages of including materials useful in performing the assessment tasks. The project author has been sourcing materials that would be useful with the assessment and determining their cost and availability. A decision will be made following the sourcing of the materials, as to whether or not it is feasible to include tangible materials with the assessment protocol. An additional section has been added that addresses the specific issues of evaluating the potential for visual efficiency of children with cortical visual impairment.

Work planned for FY 1993. The instrument will undergo a final field evaluation by both teachers of young children/multihandicapped children with visual impairments and also content review experts. Project staff will work with the project author in developing appropriate evaluation materials. Project staff will also make all contacts with potential field evaluators and coordinate the distribution of project materials and evaluations to reviewers. Project staff will stay in contact with reviewers throughout the evaluation process. The data will be compiled, analyzed, and revisions will be made to the assessment instrument. The materials will be prepared for production and project staff will follow the materials through the production process.

Light Tablet (new)

Purpose: To develop a light box sized for use on a child's desk and suited for home use by students served by itinerant teachers; the Light Tablet will use many of the materials designed for the larger Light Box and may include some new materials designed for its specific size and use

Project staff: Suzette Wright, Project Director
Tom Poppe, Model and Pattern Maker

Background. During visits in the field, a number of teachers using the Light Box have expressed a need for a smaller version of this device which would easily fit on a child's desk or lap. In addition, this smaller, less expensive device could more easily be left in the home for use by students between teacher visits. A needs assessment conducted at the international gathering of the Association for Education and Rehabilitation of the Blind and Visually Impaired in July of 1992 gave priority to the need for such a device. In the state of Utah, parent advisors recommend all parents make light boxes for the home by adapting the "Light Brite," a toy which features an incandescent bulb which lights a surface approximately 9 x 12 in. Students likely to use the smaller Light Tablet are those who have residual vision and function from birth to 6 years of age. The smaller size of the Light Tablet, however, may expand its use for students working in classrooms at desks. The Light Tablet will have the capacity to be dimmed by a rheostat, if such a circuit can be devised, or by overlays with gradients which will screen out varying amounts of light. A circuit which will power the tablet with rechargeable batteries is being investigated.

Work planned for FY 1993. When the type of circuit needed to power the Light Tablet has been determined, it will be possible to design the physical shell for the tablet. A survey of teachers of students in the target population will be taken. Information from the survey will assist in development of the Light Tablet and selection of materials and activities for the new device. Preparations will be made to evaluate the Light Tablet and suggested accompanying materials with students and their teachers and parents.

Braille

Braille Language Program (continuing)

Purpose: To develop a set of beginning language materials consisting of two components, spelling and English, which will minimize problems in these curricular areas commonly encountered by beginning braille students

Project staff: Hilda Caton, Project Director
Eleanor Pester, Assistant Director
Eddy Jo Bradley, Directing Editor
Eric Hamp, Linguist
Betty Modaressi, Editor

Background. This project was partially funded under a grant awarded to the APH by the Federal Research in Education of the Handicapped Program's Field Initiated Research competition which is administered by the Special Education Programs, Office of Special Education and Rehabilitative Services, U.S. Department of Education. The resulting product has been approved for production.

Work began on the project in January 1984. Information on achievement in language, spelling, and word study skills was obtained through administration by teachers of a special braille edition of the Stanford Achievement Test, Intermediate I, Form E to 57 blind 4th and 5th grade students to identify specific problems. Analyses were made of current spelling and English textbooks and of Patterns: The Primary Braille Reading Program. This information was used to develop the program.

The program consists of four levels, A through D. Each level of the program was drafted, reviewed, revised, and sent to pilot test sites for evaluation. Then the consulting committee met and reviewed the materials. Further revisions were made based on these evaluations.

These materials were then placed with over 50 students and approximately 20 teachers at field test sites across the country. Annual visits were made to the sites to explain the field evaluation procedures, to check on progress, and to observe the materials in use. Criterion-referenced tests were administered as the children completed each level. Test results were sent to APH for scoring and analysis.

Federal support for the project ceased December 31, 1989, at the end of the project's 5th year, but field testing of the materials continued with new materials sent to the field test sites as students were ready for them. Revisions of the materials based on the field evaluations proved to be extensive.

Work during FY 1992. Since teachers who have field tested the program tend to want to continue using the program with new students, there were still students working in Level C and in Level D with five teachers in four states during the 1991-92 school year. Level A was prepared for production and will be ready for the beginning of the 1992-93 school year. Revisions of Level B were somewhat delayed due to the illness and subsequent death of directing editor, Eddy Jo Bradley. Betty Modaressi, who had worked with Mrs. Bradley in the past on some of the Patterns reading materials, worked on the revision of Level B.

Work planned for FY 1993. The revision of the Level B materials will be completed and prepared for production. Level B will be ready for distribution by January of 1993. Plans are to proceed with final revisions and production preparation of Level C as soon as Level B has been completed. Field testing of Level D will continue with two or three teachers who still have students working in Level D.

Linguistic Analysis of American Literary Braille, Grade 2
(continuing)

Purpose: To conduct a thorough and systematic linguistic analysis of American Literary Braille, Grade 2, which will incorporate the new braille terms developed for Patterns: The Primary Braille Reading Program

Project staff: Hilda Caton, Project Director
Eric Hamp, Linguist
John Siems, Data Analyst and Computer Programmer
Fred Otto, Project Assistant
Eleanor Pester, Project Assistant

Background. No systematic analysis of American Literary Braille has been conducted. The British have completed a major contraction study of their system which included frequency of occurrence of braille contractions in written text. That study, however, did not consider a grouping of braille configurations (contractions) which was different from the groupings now in use. This linguistic analysis of American Literary Braille was somewhat similar to the British study except that it used the new terms (groupings) used in the braille reading and language programs developed at APH and extended the analysis to areas not included in the British study. The basic plan included the following steps:

1. Selection of appropriate text materials for the analysis
2. Marking (or bracketing) of the braille configurations defined in Patterns: The Primary Braille Reading Program
3. Counts of the frequency and order of occurrence of those elements in the text materials
4. Revision of the order and groupings of braille rules in the publication English Braille: American Edition 2 with an emphasis on more effective orders and groups for teaching purposes
5. Publication of various types of materials to assist in the teaching and learning of braille

These text materials selected for analysis consisted of 25 samples from the corpus which forms the basis of the publication, Computational Analysis of Present-Day American English (Kucera, H., & Francis, W. N., 1967), generally known as the Brown Corpus. This publication contains 1,014,000 words and consists of 500 samples each of about 2,000 words, taken from contemporary publications in American English. The 25 samples used in the analysis are representative of all types of literature in the Brown Corpus.

The computer translation of the selected samples from the Brown Corpus was completed, printed, and proofed. The line by line marking and counting of all braille units, contractions, composition signs, punctuation, and numbers (alphabetic and numeric) continued and some preliminary results were tabulated. The marking and counting of various other types of braille units continued (i.e., the frequency of occurrence of certain braille units which occur in several different forms depending upon where they occur in a line, next to punctuation, etc.). Further analysis was made of the braille units already identified and a report was written describing the completed part of the analysis and the implications for teaching and learning of the braille code. Counts of all braille units--letters (alphabetic and nonalphabetic), grams, punctuation, and registers--were completed, line by line, for each of 25 articles and a total of all 25 articles combined.

Work during FY 1992. The following parts of the analysis have been completed with samples from the Brown Corpus and the Reader's Digest:

1. lower signs (written in full spelling vs. contracted) and spacing
   a. incidence of word to
   b. incidence of words by, be, his, was, were, enough, into, in
2. correlations with print in length (e.g., mother is a six letter word in print and a two cell contraction in braille)

A count of phonograms and morphograms for the samples is also in progress. The capitalization study for comparison with British braille may no longer be necessary since the British are using more capitalization tending to make their code more like American braille. Project staff collaborated on a report on the frequency of occurrence of lower cell braille units. This report is expected to be the first of several reports based on this linguistic analysis. These reports will be submitted for publication as either a monograph or as a series of articles.

Work planned for FY 1993. Analyses will continue with expansion of the examination of the lower cell signs along with words occurring before or after them, the correlation of length of words in print and braille representations, and the count of phonograms and morphograms from the samples. Reports will be written as each part of the analysis is completed.

Adult Braille Writing Program (continuing)

Purpose: To develop an instructional braille writing program for adults with both slate and stylus and braillewriter components

Project staff: Hilda Caton, Project Codirector
Eleanor Pester, Project Codirector
Betty Wommack, Materials Developer
Fred Otto, Project Assistant

Background. To provide a truly comprehensive program in braille instruction for adults, it is necessary to teach students how to write as well as how to read braille. There is very little research available on braille writing for either children or adults. A survey done by Lowenfeld, Abel, and Hatlen (1969) reported that braille writing was usually introduced to children at the same time as braille reading and that the braillewriter was usually used to teach braille writing. No other research is available on braille writing instruction. This includes research on the use of the braillewriter and the slate and stylus for children or adults.

From the time planning for Patterns: The Primary Braille Reading Program and Read Again: A Braille Program for Adventitiously Blinded Print Readers began, the need for formal braille writing instruction was recognized. An introduction to the use of the braillewriter for children was written as part of the Braille Language Program. This could be revised for use with adults. Also, during the past few years several slate and stylus programs for children and adults have been developed. A review of these showed that a program by Betty Wommack most closely corresponds to the philosophy of slate and stylus instruction which has been developed at APH. Betty Wommack discussed her program with project personnel and has expanded it based on this discussion. The possibility of developing a device with pegs which could be pushed from one side to the other in about 10 cells to simulate writing and then reading braille on a slate was explored. The completed program would consist of instructions for writing braille with both a braillewriter and a slate and stylus.

Work during FY 1992. The revision of Betty Wommack's slate and stylus program was completed and lessons on the braillewriter from the braille language program were revised to use with adults and to parallel the material covered in the slate and stylus program. A practice slate device with pegs was developed and tried out informally with blind adult employees and with some children in the summer school program at the Kentucky School for the Blind since it is anticipated that this device could be used with both groups.

Work planned for FY 1993. The complete braille writing program, including the Swing Cell and the new practice slate, will be prepared for field testing. It will be placed in the field for evaluation in several programs for use with adult students for 8-12 weeks. Data collected from this field testing will be analyzed and used to make revisions before preparing the program for production.

Press Braille Paper Study (discontinued)

Purpose: To determine user opinions and preference for four kinds of braille paper

Project staff: June Morris, Project Codirector
Debbie Willis, Projector Codirector

Background. APH has been using a paper manufactured by Howard Mills for its press braille products. This is an extremely high quality paper that is also extremely expensive. In an effort to identify possible options, a study was planned comparing user acceptance of four braille papers produced by different manufacturers. These are Howard Mills, Scott, Sorg, and Gladfelter.

Work during FY 1992. This study was discontinued as the Scott and Sorg papers under consideration failed to meet required physical specifications. The Gladfelter paper meets the National Library Service for the Blind and Physically Handicapped requirements and, therefore, will be an option for APH.

The Braille Research Center (new)

Purpose: To write a proposal and establish a braille research center at APH to conduct research on braille and other tactile representations with primary emphasis on basic research

Project staff: Hilda Caton, Project Director
Eleanor Pester, Associate Project Director

Background. The trustees of the American Printing House for the Blind have always recognized braille as an important area of research. Now braille bills, literacy discussions, and computerized braille production are all encouraging greater emphasis on the teaching of more braille. Meanwhile braille authorities internationally are moving toward the establishment of a standard English braille code for all English speaking countries of the world. Also a uniform braille code which will incorporate all American braille codes except the music code is being developed by the Braille Authority of North America (BANA). Therefore, braille research is taking on new importance. The establishment of a braille research center to conduct research on braille and other tactile representation with primary emphasis on basic research would highlight the importance APH places in this work.

Work during FY 1992. On April 15-17, 1992, the following people will met with APH staff to write a proposal for establishing a braille research center at APH:

Dr. Emerson Foulke, Professor, University of Louisville, Louisville, Kentucky
Dr. Philip H. Hatlen, Superintendent, Texas School for the Blind and Visually Impaired, Austin, Texas
Dr. Dean Tuttle, Associate Professor, University of Northern Colorado, Greeley, Colorado
Dr. Robert Winn, President, The Hadley School for the Blind, Winnetka, Illinois

This proposal will be submitted to the APH Board of Trustees for funding consideration and progress on the project was reported to APH's Educational Research Committee in May.

Work planned for FY 1993. Funding for the initiation of the Braille Research Center was provided by the APH Board of Trustees and the Center was established on September 1, 1992. Planning will begin for its administration and operation during FY 1993. A proposal to assist in the development of the new uniform code for American braille will be written and submitted to BANA. Other proposals for research projects will be written and funding sought for their support.

Educational Measures

Adaptation of Educational and Vocational Tests (new)

Purpose: To identify and adapt widely used academic tests for braille and/or large type users

Project staff: Bill Duckworth, Project Director
Hilda Caton, Project Codirector (Vocational)

Background. Since the 1920's, APH has provided academic tests for use by the population it serves. Efforts are made to provide those tests most commonly used throughout the country. In recent years agencies serving the blind adult population have indicated a need for instruments, either adapted or developed, for use in assessing the skills of this population. The APH Educational Research and Development Committee further requested APH to adapt or develop instruments that could be used to assess skills of blind students and adults, with particular attention being given to those used for employment purposes. In March of 1991 meetings were held in the areas of school age needs and adult needs to determine if experts in evaluation could readily identify specifics or an approach to determine specific instruments. The primary recommendation of the committee concerning adult needs was that project staff visit rehabilitation agencies, including Veterans Administration agencies, to (a) see what kinds of assessment materials are available and being used and (b) query vocational counselors about kinds of information they need to place clients in appropriate jobs.

In addition, surveys were conducted of test publishers and through the APH Slate requesting information on widely used tests and the present felt needs of schools and agencies serving the blind population. While measures were identified, a determination was made to contact agencies for more specific information on practice and needs, taking into consideration the information collected on these surveys.

Work during FY 1992. A visit was made to the Chicago Lighthouse for the Blind, the Illinois Visually Handicapped Institute, and Hines Veteran's Hospital. The visit was to determine what was being used to evaluate clients in rehabilitation. APH hopes to fill any existing gaps as to academic evaluation by developing or adapting educational measures that are needed to evaluate this population in terms of job placement, counseling, or the determination as to what additional training may be needed to enable a client to enter the work force at a level commensurate with his/her abilities. While a variety of academic tools were being used, no consistent pattern emerged as to specific tools needed. The agency personnel indicated a need for the Woodcock-Johnson Psychoeducational Battery and the two forms of the Wide Range Achievement Test. These tests have also been cited as needed in

surveys of agencies dealing with school age students. Due to renorming problems, it was found not to be feasible to adapt the Woodcock Johnson test. With the personnel dealing with adult blind, however, no other specific tests, or types of tests, were specified. A determination, by the visiting project staff, was made to investigate further those practices and needs of agencies working with this population. A direction of further visitations, telephone surveys, and mailing surveys were discussed in light of what is known of present practices by agencies concerned.

Work planned for FY 1993. The Spache Diagnostic Reading Scales and the Wide Range Achievement Tests will be adapted into braille and large type following receipt of permission by the tests publishers. Both of these instruments will be useful to school age and adult populations. A complete list of instruments to be adapted, or under consideration for adaptation, follows.

Tests Under Consideration

1. Spache Diagnostic Reading Scales

2. GED Practice Test. (Ordered and permission to adapt requested.)

3. Nelson-Denny Reading Test. (To be investigated.)

4. Test of Reading Comprehension (TORC). (To be investigated.)

5. Key Math Arithmetic Test. (Found to be technically inadequate.)

6. Kauffman Test of Educational Achievement. (1985--Revision will be investigated.)

7. Diagnostic Achievement Battery (Pro-Ed). (Will be investigated.)

8. Boehm Test of Basic Concepts. (Ordered--concepts tested will be compared to the Brigance Diagnostic Inventory of Early Development (Revised 1991), to see if the Boehm revision is needed.)

9. Bracken Test of Basic Concepts (ages 2-8). (Ordered--doubtful in that pictures may hinder adaptation.)

10. Cognitive Abilities Scale. (Will be investigated--would require extensive adaptation with possible field evaluation.)

11. Adaptive Behavior Inventory. (This has come up in a discussion in terms of APH doing this teacher survey type of test with a doctoral program student at Central Michigan University.)

12. Wide Range Achievement Test (WRAT-R1 and WRAT-R2). (Requested as a result of survey and during visitation.)

Other evaluative tools will be investigated as discovered by investigation or recommendation. As these, and other tests are approved for adaptation, they will move through the adaptation process with adapted Directions for Administration.

Survey of Textbooks. Academic Tests, and Educational Software Used in Programs Serving Visually Impaired Students (new)

Purpose: To identify textbooks and tests for which braille and large type editions are needed

Project staff: David Bice, Project Codirector
Bill Duckworth, Project Codirector

Background. Previous surveys querying ex officio trustees about their anticipated needs for textbooks and tests have provided little specific information. The problem has been that the surveys have not been completed by persons in local schools or school districts serving legally blind students.

Work planned for FY 1993. During the fall of 1992, APH's ex officio trustees will be asked to cooperate with an effort to channel requests for specific textbook, academic test, and educational software use directly to the local schools where blind students are being served. This is a major component of a larger program focused at enabling APH to better meet the country's needs for braille and large type educational materials. Specific information about this survey will be presented at the October 1922 Annual Meeting.

Microcomputer Applications

Monitoring Technological Developments and Educational Applications (ongoing activities)

Purposes: (1) To identify and determine priorities for needs for educational materials to support use of microcomputers

(2) To monitor technological developments and educational applications of technology

(3) To disseminate information on current uses of technological aids

Project staff: Debbie Willis, Research Scientist
Larry Skutchan, Systems Programmer
Fred Otto, Research Assistant
Rob Meredith, Programmer
Venus Elder, Research Assistant

APH has a number of ongoing activities that enable the Microcomputer Group to stay informed of technological developments, educational applications of these developments, and particular computer-related needs of visually impaired persons.

One such activity has been a series of Microcomputer Advisory Committee Meetings. An advisory group was formed in 1984 to provide specific information and guidance on a continuing basis. Eight such meetings were held, the first in August 1984, the eighth in January 1991. A ninth meeting is planned for early in 1993.

As the use of computers has increased over the past several years, trends and changes in the computer industry and in education have been monitored through literature reviews, attending conferences and exhibits, talking with a variety of people involved in computer technology, and perusal of SpecialNet and GEnie bulletin boards. As part of the Microcomputer Group's ongoing activities, students using computers with a variety of software and peripherals in a variety of settings are observed whenever possible.

Conferences and exhibits attended during FY 1992 have included ConnSENSE '91, the First World Congress on Technology for People with Disabilities, Closing the Gap, the 1992 Kentucky Education Technology Conference, the Twelfth Annual Florida Education Technology Conference, the First Annual Florida Adaptive Technology Impact Conference, the California State University at Northridge Technology Conference, and the Kentucky Assistive Technology Users Group Conference. Optical Data Corporation was visited to learn about their multimedia programs, in particular their Windows on Science program. Questions involving teachers attempting to use multimedia programs with

visually impaired students were included in a survey to APH's ex officio trustees. An IBM representative was invited to give a presentation on multimedia at APH's 1991 Annual Meeting.

APH's survey on Talking Software Priorities was conducted as needed, and the results reported to the Educational Research and Development Committee at APH's 1991 Annual Meeting. Students using computers were observed during the Kentucky School for the Blind's 1991 summer session. The students were observed creating databases, using APH computer products, completing course assignments, and generally gaining proficiency with the use of current computer technology, assistive devices, and special software. Members of APH's Micro Group attended a workshop on IBM's BookManager program. The TEXT2000 project was initiated to provide visually impaired individuals access and control of textual information presented in an electronic format.

Another responsibility of the Microcomputer Group is to provide information on technology to the field. In order to disseminate information regarding trends in educational technology and technology for people with visual impairments, presentations were given at APH's 1991 Annual Meeting, ConnSENSE '91, the First World Congress on Technology for People with Disabilities, and the Kentucky Assistive Technology Users Group Conference. Presentations and demonstrations were provided to various individuals, school and university groups visiting APH. Information, answers and suggestions to a wide range of questions regarding computer products, services, and issues were provided to consumers as requested.

APH's annotated bibliography covering technology-related topics from 1980 to 1991 that are applicable to visually impaired persons was provided free on 3 1/2" disks formatted for Apple II or IBM and compatible computers. These were sent to interested persons requesting a copy and given as a handout during presentations.

In an effort to continue disseminating information to the field on APH's microcomputer materials projects, products and services, as well as selected technological needs, applications, products and services pursued outside APH, the Micro Materials Update (MMU) was written and published twice during FY 1992. The MMU was made available in print and recorded formats. As requested by members of the Eighth Microcomputer Advisory Committee, a fourth article on telecommunications was included in the Spring 1992 issue. Four thousand print copies of the Spring 1992 edition and 800 copies of the recorded edition were produced. Of these, approximately 2,500 print copies and 500 recorded copies were mailed to those persons, schools, and agencies included on the MMU database. Additional copies were placed in stock. These are sent to individuals, professionals in the field, schools, agencies, and companies as requested, in

response to inquiries regarding computer-related products, and as handouts at conferences, presentations, exhibits, and at demonstrations of computer products for individuals with severe visual impairments.

In order to evaluate user satisfaction with APH microcomputer products, to monitor and improve project planning and management, and to continue identifying users of APH's computer materials, a "User Survey Card" is packaged with each of APH's computer-related products. Information on these cards is entered onto a database. Requests for information, questions and difficulties with products that are expressed on the cards are addressed by phone, mail, or FAX by members of the Microcomputer Group. Suggestions for changes to current products and ideas for future technology-related products are entered onto the database. Consumers who responded to the "User Survey Cards" continued to be entered onto the database to receive current and future issues of the MMU.

These activities, as well as serving on appropriate committees regarding technology, education and rehabilitation of visually impaired persons, and publishing papers whenever possible, assist the members of APH's Microcomputer Group with their goals to stay abreast of current technology and its applicability to people with severe visual impairments, to adapt and develop appropriate computer products needed by visually impaired individuals, and to actively disseminate information on technology to the field.

Products

APH PocketBraille (completed)

Purpose: To develop and refine a portable note-taking device

Project staff: Larry Skutchan, Project Director
Fred Otto: Project Assistant

Background. The Kentucky Department for the Blind developed the PocketBraille and PortaBraille. Each is a complete portable note-taking system with braille keyboard, parallel and serial ports, and a speech synthesizer. The PortaBraille additionally contains a braille display. Each contains firmware that makes writing and editing possible. With the approval of its Educational Research and Development Committee, APH began designing a version of this system. It is called the APH PocketBraille. The APH PocketBraille was first marketed in June 1988. Since then, one revision was made and released. It corrects some "bugs" in the original system, improves speech quality and responsiveness, and compensates for differences in a part that is no longer available in the United States. Upgrading this product was a recommendation of the Eighth Microcomputer Advisory Committee.

Work during FY 1992. A completely new editor, operating system, and user interface were written. All known "bugs" were identified and corrected.

The new software uses a file metaphor to help insulate the user from hardware restrictions by letting him/her give his/her work names. Earlier versions required the user to divide work into memory banks. This was inconvenient because there were only seven banks, and each bank was a fixed size. In contrast, the new operating system lets the user create files of any size within the total limits of the machine. In addition, the operating system lets the user have 250 different files in which to organize his work.

The new operating system, along with the capability of creating files, provides the user a variety of file management functions which were all written this year. These include protecting files, setting the status of the reverse translator, deleting files, inserting other files into the currently opened file, and renaming files. In addition, another file-related feature was written and installed. It lets the user specify the nature of the work in the file. In other words, the user can tell the previous and next line commands to navigate through the file either line by line or sentence by sentence. Each file also maintains its status as grade 2 braille text or plain ASCII text.

A significant development in the new firmware is the new editor. In previous versions of the firmware, APH PocketBraille's editor was primitive. It was totally line oriented and not very flexible. The new editor gives the advantage of paragraph orientation and an insert mode that is always active. The paragraph orientation gives the user more power when it comes to inserting large passages or moving large bodies of text from document to document. The insert status lets the user enjoy greater power by providing a more natural and easy way to edit. When the user wants to add text to the middle of a paragraph, he just moves to the point of interest and types it. The older editor required the user to enter an insert mode, type the text, then exit the insert mode. The older editor also allowed inserting only 255 characters at a time, and there was a noticeable delay while the text was placed into the buffer. The new system shows no delay and has no limitation on the amount of text that is inserted at a time. In fact, as mentioned earlier, the user can actually insert entire files at the cursor.

A new search and replace function was written for the APH PocketBraille's editor. Earlier firmware revisions permitted only finding, but not replacing. The search and replace lets the user replace either automatically throughout a document or individually on a case by case basis.

Other features written and installed in the new editor include deleting to the end of the document, deleting a block of text, deleting to a specific character, and deleting by words and to the end of a paragraph.

While the operating system and editor represent significant enhancements to APH PocketBraille, the parameter setting method was completely rewritten and a new voice box mode was designed and installed. Earlier revisions of the firmware required the user to know the commands to access parameter settings such as changing baud rate, parity, and data length. Now, when the user presses Chord-P, APH PocketBraille presents a menu showing the settings and the value selected for that setting. The user can select new values by using the previous and next word commands, or select new settings by using the previous and next line commands.

The speech box mode was rewritten. It is now called voice box and it provides some significant features to make APH PocketBraille act as a valuable synthesizer for use with a screen access program on the PC. APH PocketBraille's voice box features a new way of silencing the speech that proves very handy. This new method silences speech to the next phrase which makes scanning through familiar text much more efficient.

The manual was written, edited, and turned over to production. The new firmware was field tested and has been turned over to production.

Work planned for FY 1993. Work on this project is complete. Customers will be notified of the new revision, and units in the field will be updated at no cost.

APH has determined that with the introduction of other note-taking devices, it will not be practical to continue with development, so there will probably be very few upgrades to the software, except to fix problems.

Authoring Program (new)

Purpose: To assist the microcomputer group to develop more software and instructional material by using authoring techniques

Project staff: Larry Skutchan, Project Codirector
Debbie Willis, Project Codirector
Rob Meredith, Programmer
Venus Elder, Project Assistant

Background. Members of the Seventh and Eighth Microcomputer Advisory Committees suggested APH staff use authoring software to create lessons in high interest areas like math drill and practice, early childhood, and high interest low vocabulary age appropriate interactive instructional and practice material. Using authoring software would let the microcomputer group develop more badly needed material without actually requiring any programming for those areas where it would be appropriate.

The microcomputer group examined several authoring packages including E-Z Pilot II and Tutor-Tech. The group found limitations to each of these but decided that there are some possibilities for limited applications. Ideally, the microcomputer group would like an authoring system that permitted both text-to-speech support and large print access. APH's interest in expanding into the MS-DOS and Macintosh platforms means that an ideal authoring system would create lessons that run on those machines as well as the Apple II. As far as the microcomputer group knows, no such system exists. Of course, this naturally leads to the question, "Why not write one's own authoring system to satisfy these special needs?" And, this is the perfect solution except for the matter of the programming involved in such a project. In the time before such a system can be created, the microcomputer group will concentrate on using existing software to develop appropriate material where possible.

Work during FY 1992. The microcomputer group examined E-Z Pilot II with a view toward the recommendations made by the committees. Unfortunately, The findings were far less than satisfactory. The lessons are very limited in size and performance is dramatically impaired when lessons get very big. More importantly, though, the lesson that gets created isn't accessible with speech when the disk is booted. In other words, in order to use one of the lessons created, the student either requires sighted help to pick the lesson or he must memorize the keystrokes required to access the lesson of interest. Perhaps the biggest drawback to using E-Z Pilot II for developing lessons that APH could distribute, however, is the fact that there is no provision for using the lessons without the end user actually owning E-Z Pilot II. Such an arrangement causes problems for

APH's ordering department, the technical support personnel, and the end user. Besides, it is not reasonable to ask the user to learn a whole application (E-Z Pilot II) before accessing lessons for general distribution.

The microcomputer group also examined an authoring program called Tutor-Tech. Tutor-Tech holds more promise than E-Z Pilot II for distributing lessons in a stand-alone format (where the end user can simply boot the disk and use the lesson), but there are some drawbacks to this system, too. The main drawback with Tutor-Tech is that it is graphics based. A new release of the program does provide the ability for external commands, however, which means that the programming team could modify text-to-speech software to function when specifically accessed in this environment.

Work planned for FY 1993. The microcomputer group will attempt to use Tutor-Tech to create lessons for some of the identified areas. The programming team will adapt text-to-speech to run in the Tutor-Tech environment.

High Interest Low Vocabulary Age Appropriate Software
(continuing)

Purpose: To adapt/develop high interest low vocabulary age appropriate microcomputer materials for developmentally delayed students junior high and above

Project staff: Venus Elder, Project Codirector
Debbie Willis, Project codirector

Background. The Seventh Microcomputer Advisory Committee gave a high-priority to adapting or developing high interest low vocabulary age appropriate software for developmentally delayed blind students junior high and above. In order to identify and determine priorities for this area, a "High Interest Low Vocabulary (High/Low) Age Appropriate Software Needs Meeting" was held. In preparation for the meeting, an annotated high interest low vocabulary bibliography was compiled.

The target audience identified by the High/Low committee members was: Totally blind, marginally academic students, junior high and above, who are behind in reading and math (for a variety of reasons), and are reading at a fourth-fifth grade level. During the meeting, three major priority areas were identified: (1) daily living skills, (2) study skills, and (3) job-seeking skills. Top priority for daily living skills was given to handling money, money identification, making change, and budgeting. The top priorities determined for study skills were outlining, determining important facts, note-taking, and writing papers. The top priorities for job-seeking skills were career exploration and interest assessment.

The Seventh Microcomputer Advisory Committee recommended: (1) that the Micro Group initially create or adapt a single software selection with support materials in each of the three major areas identified; (2) that the computer-related activities within each of the three major priority areas be related to reading, writing, and math; (3) that the Micro Group plan on software being used as a supplement to class or by an itinerant teacher or in a resource room; (4) that the software be reinforced with braille, large type, and/or audio materials for student use; and (5) that if APH develops these programs from scratch, a programming language be used which allows the software to work on IBMs and compatibles and Apple II computers. If this cannot be done or if programs are being adapted rather than developed, make the daily living skills and study skills software usable on Apple II computers; the job-seeking skills software usable on IBMs and compatibles.

Software titles from a variety of companies including MCE, Job World, and Sunburst were previewed for possible project development. A variety of materials dealing with handling money, money identification, making change, and budgeting were reviewed. Concepts were pulled from software which met the project priorities regarding dealing with money. A listing of support personnel and other resources was compiled and a database was started to keep track of the information.

Work during FY 1992. Due to work on other high priority projects, and because the talking authoring program that is needed to write the software-based lessons for the High Interest Low Vocabulary Age Appropriate Software Project was still being investigated, a minimal amount of progress was reached during this period of time. (See write-up on Talking Authoring Program.) Material for the ongoing resources database covering appropriate personnel, project related software, and support material was gathered.

An article was written for the Spring '92 issue of the Micro Materials Update to solicit responses from those in the field who might have information or suggestions concerning the three identified high-priority areas within the project. A few suggestions were received. Lesson stacks created by educators were purchased for preview and information was gathered concerning additional "Tutor Tech" stacks which model project related areas.

Work planned for FY 1993. Once it has been decided which authoring program will be used to create the data disk "lessons," appropriate people will be identified and surveyed regarding the most common/essential concepts of handling money that the target population of legally blind students needs to know (particular curricula, books, or programs and materials they use in teaching money matters). A subcommittee consisting of approximately four teachers/professionals and APH's Microcomputer Group will meet to discuss basic areas/content the software and support materials should follow (goals and objectives). The subcommittee will work on specific computer-related activities needed to achieve the goals. The data disks of "lessons" will begin to be written and support materials/documentation will be designed and drafted. The initial data disks of "lessons" and drafted support materials/documentation will be sent to the subcommittee members and selected members of the Microcomputer Advisory Committee for evaluation. The "lessons" and accompanying materials will be revised based on the field reviews. The revised materials will then be reviewed in-house and changes will be made as necessary. In its last stage, the total program will be reviewed by appropriate consultants and final modifications will be made as needed to complete the project.

Large Print Program (new)

Purpose: To provide large print output to the screen for use on the Apple II series of computers

Project staff: Larry Skutchan, Project Codirector
Debbie Willis, Project Codirector
Rob Meredith, Programmer
Venus Elder, Project Assistant

Background. The participants of the first seven Microcomputer Advisory Committee meetings focused on providing material for totally blind computer users. They felt that partially sighted users had more of a software selection from which to choose with off-the-shelf software. The Eight Microcomputer Advisory Committee recommended focusing more on both totally blind and partially sighted users by incorporating large print into new titles released at APH. They also advised that large print output for those programs that support printing would be desirable. Further, the committee recommended incorporating more graphics for motivational purposes.

Work during FY 1992. The Microcomputer group evaluated the merits of including large print code in each new release and the possibility of developing a large print preboot program for use with existing software. Initial findings indicate that future software can include large print capabilities, but that the large print interface makes speech access suffer. This degradation is due to the extra overhead required to display large print. The group is, however, developing routines that can be used in future titles. The microcomputer group has also looked into the requirements for developing a preboot program to provide large print capabilities to other software. Initial findings indicate that the IIgs is the only member of the Apple II family that could handle the overhead and provide the access for commercial applications. The programming team evaluated font technology to determine the most flexible techniques. They concluded that in order to function under the largest number of operating systems (DOS 3.3, ProDOS, and GS/OS), the font would have be limited to a fixed size. Scalable fonts, in short, would not be feasible in the targeted environment.

Work planned for FY 1993. Work will continue developing and perfecting routines for inclusion in future titles. The microcomputer group will also begin coding on the preboot program to provide large print access to applications software. Fortunately, many of the techniques required for this purpose have been perfected in the work already done with Textalker-gs, so the majority of work will be specific to large print access.

Manuals (completed)

Purpose: To provide manuals in braille, large type, recorded, or disk form to support use of commonly used microcomputer equipment and programs

Project staff: Debbie Willis, Project Director
Larry Skutchan, Systems Programmer
Fred Otto, Project Assistant

Background. At the Fourth Microcomputer Advisory Committee Meeting, it was recommended that APH continue to provide manuals deemed important in a medium usable by visually impaired persons.

After protracted correspondence with Claris Corporation, APH received permission to publish the Appleworks Reference Manual and AppleWorks Tutorial on disk. Project staff had to devise language for the license agreement which would satisfy Claris' concern over use of the disks by people who are not visually impaired. Upon consideration of the presentation of the content in the AppleWorks Tutorial, it was decided that a disk-based version that would be read primarily through a speech synthesizer would not be useful, since the reader would have to stop the manual-reading program and start AppleWorks each time a new series of steps was called for in the Tutorial. Permission was received from Claris Corporation to produce a tape recorded version of the AppleWorks Tutorial, which would allow the reader to move easily between the text and the program. Preparation of the AppleWorks Tutorial for recording in the APH studios and adaptation of the AppleWorks Reference Manual for use on disk were completed during FY 1991.

Work during FY 1992. After the manual reading program was added to the disk version of the AppleWorks Reference Manual, it was given final in-house reviews and necessary changes were made. A master 3 1/2" disk formatted for Apple II computers was produced for manufacturing purposes.

The AppleWorks Tutorial was reviewed by members of the Micro Group and final editing done for recording. An introduction to be included with the manuals was written and a camera-ready large print master for duplication purposes was produced. After the production document for these manuals was written, they were turned over for manufacturing. The disk version of the AppleWorks Reference Manual will be packaged with the recorded version of the AppleWorks Tutorial. A large print and braille introduction will accompany these special editions of AppleWorks Manuals.

The AppleWorks Manuals were produced and became available during FY 1992.

Work planned for FY 1993. No additional manuals are planned at this time. Future manuals will be made available in accessible media as the need arises.

Math Drill and Practice Program (continuing)

Purpose: To adapt/develop math programs for practicing/reinforcing skills in addition, subtraction, multiplication, division, decimals, fractions, percentages, grouping and regrouping

Project staff: Debbie Willis, Project Director
Venus Elder, Project Assistant
Fred Otto, Project Assistant

Background. At the Seventh Microcomputer Advisory Committee Meeting, the participants recommended using an authoring program such as E-Z Pilot II to adapt/develop some math drill-and-practice software. At the Eighth Microcomputer Advisory Committee Meeting, the participants recommended enhancing Teacher's Pet to adapt/develop software in areas that had been identified at the Sixth and/or Seventh Microcomputer Advisory Committee Meetings as high priorities (e.g., early childhood programs, high interest low vocabulary age appropriate software, and math drill-and-practice programs).

E-Z Pilot II was purchased to investigate its usefulness. It was found that when combined with an Echo II speech synthesizer, E-Z- Pilot II could be used to create "talking" interactive lessons. The E-Z Pilot II program itself, that must be used to create the talking lessons, does not talk except in review mode when using Textalker-gs. A blind person, therefore, could only create the lessons using speech synthesis when in review mode using an Apple IIGS.

Work during FY 1992. To examine E-Z Pilot's usefulness and limitations in creating "lessons," some sample drills were created. Some problems with regard to speech output were identified (e.g., the menu of options does not speak). It was also determined that E-Z Pilot would need some reprogramming in order to function appropriately with TEXTALKER, Textalker-gs, and the whole Apple II family of computers.

A demo of Techware's Tutor-Tech was previewed. The Tutor-Tech program makes use of digitized speech compatible with the Echo speech synthesizer. The total dictionary of digitized words currently available from Street Electronics is 4,000 words. The Tutor-Tech program and disk of digitized words were ordered.

Work planned for FY 1993. The Tutor-Tech program will be evaluated. Sample lessons will be created to determine its usefulness. After considering the particular problems and limitations of each authoring program, a decision will be made whether to initially use E-Z Pilot II or Tutor-Tech to adapt a math drill and practice program.

A questionnaire will be developed regarding types of math drill-and-practice materials teachers are using (particular curricula, books, or programs and related materials) to reinforce basic math concepts. The questionnaires will be sent to appropriate teachers/professionals.

Math materials that practice/reinforce skills in addition, subtraction, multiplication, division, decimals, fractions, percentages, grouping and regrouping, that can be presented appropriately within the structure of the selected authoring program, will be chosen. Permission to adapt the original math program will be sought. Once permission is obtained, the program will be adapted and talking interactive "lessons" created using the selected authoring program. Support materials and documentation will be designed and drafted.

After an initial in-house review, the "lessons" and drafted support materials/documentation will be evaluated by consultants and by members of the Micro Advisory Committee. The "lessons" and support materials/documentation will be revised utilizing the comments and suggestions of the reviewers.

A talking authoring program will also be needed for future projects which require lessons, tutorials, and/or a broad range of question/answer selections that could be written by a nonprogrammer. (See write-up on Talking Authoring Program.)

MECC Software (continuing)

Purpose: To adapt widely used educational software distributed by the Minnesota Educational Computing Corporation (MECC)

Project staff: Debbie Willis, Project Director
Larry Skutchan, Systems Programmer
Venus Elder, Project Assistant
Fred Otto, Project Assistant

Background. Participants in the Second, Third, Fourth, Fifth, and Sixth Microcomputer Advisory Committee Meetings and members of the Educational Research and Development Committee at APH's 1986 Interim Meeting and 1988 Annual Meeting assigned high-priority status to the development of speech-adapted software from MECC.

After completing the talking version of Elementary Volume 1--Mathematics, permission was sought and received from MECC to modify additional selections, including Elementary Volume 5--Language Arts (Prefixes).

Elementary Volume 5--Language Arts (Prefixes) was completely reworked in order to operate more quickly, to keep student records, and to set up each file so that the teacher will be able to alter the files in any way desired. The puzzles on the disk were also improved and the question/answer choices were randomized to provide greater use of the program for each student. The program was reviewed several times in-house and by outside consultants. Many "bugs" in the program needed to be worked out before it operated appropriately.

The supplement, to accompany the original MECC manual and the talking version of Prefixes which includes talking versions of the original Prefixes print worksheets, was rewritten for the revised program. The word lists used in the Prefixes program were included in the supplement to be provided in large type and braille so that the blind students' activities would not be made more difficult by becoming a spelling problem in addition to the task presented. The supplement discussing the changes and new operational features of the program was reviewed and edited.

The final draft of Elementary Volume 5--Language Arts (Prefixes) was sent out for evaluation. Numerous suggested changes were made by the consultants. Programming changes were made as recommended by both in-house and field reviewers. Some of the program's activities were reworked to simplify the language used and to reflect more modern age-appropriate questions. Instructions were altered to give precise information. The program was enhanced with a tone-playing algorithm and small musical selections were added to the

tutorials associated with each of the lessons. To add appeal for the low vision users, simple pictures were created to show while making the transition from tutorials to the lesson program. An "Extensions Manual" which provides pre- and post-computer integration activities to supplement the talking version of Prefixes was written.

An in-house review of Prefixes indicated continued difficulties with the crossword puzzles and numerous small problems. The crossword puzzles were reworked for ease of use and speed in constructing the puzzles.

As a result of in-house reviews, a final list of changes needed on the Prefixes program was developed and turned over for reprogramming and debugging the software.

Due to work on other higher priority projects, the final programming changes and debugging on the Prefixes program were not completed. Drafts of the supplement and extension activities have been completed and reviewed, but the documentation cannot be finalized until the software is in a finished form.

Work planned for FY 1993. All programming changes and debugging on the Prefixes program will be completed. Camera-ready copy of the documentation will be prepared. A final review of the total package will be made. A production document will be prepared and Elementary Volume 5--Language Arts (Prefixes) will be turned over to production.

Members of the Seventh Microcomputer Advisory Committee recommended that APH discontinue all work on MECC programs. The committee felt that modifications of these programs did not meet relevant educational needs of blind students. No additional MECC programs will be modified, therefore, unless specific selections are found that meet precisely defined educational needs of blind learners.

SEI Software (completed)

Purpose: To adapt educationally sound, commercially available software for use by visually impaired persons

Project staff: Debbie Willis, Project Codirector
Larry Skutchan, Project Codirector

Background. At the Second Microcomputer Advisory Committee Meeting, a modified version of Sliwa Enterprises, Inc. (SEI) educational software series was given high priority. The content of each SEI program is appropriate for high school and college students as well as adults. APH was able to make an arrangement with SEI for a customized edition of 33 of these programs. SEI, however, retained manufacturing rights to these programs.

In order to better serve APH's customers by determining its own production schedule, APH negotiated manufacturing rights during FY 1990 for the 33 APH/SEI talking software programs modified especially for APH. Manufacturing rights and the 33 masters were received. The masters were spot-checked; several "bugs" were found and corrected.

During FY 1991, the Micro Group received a considerable number of comments and suggestions regarding the three programs that make up the SAT series (i.e., Vocabulary Builder, Word Analogy, and Sentence Completion). The primary suggestions were that the speech on these be corrected and that pauses in the speech output be incorporated in appropriate places. These suggestions were discussed at the Eighth Microcomputer Advisory Committee Meeting. Because of other higher priorities, changes to these programs were given a low priority by the committee members.

In order to make the 33 APH/SEI talking software programs work with the new Echo II speech synthesizer when used with an Apple IIGS in the fast mode, some reprogramming needed to be done during FY 1991. The programs were then checked for problems that resulted from the programming modifications.

Work during FY 1992. The original APH/SEI User's Guide, which varied somewhat from program to program, was reorganized and rewritten as necessary so that only one generic manual could be produced for the entire line of APH/SEI talking software. Small portions of the manual had to be deleted in order to accomplish this goal. The generic manual was created for ease and efficiency of the production process.

Work planned for FY 1993. Sales of the programs and suggestions for changes will continue to be monitored to determine the need for any further activity.

Talking Literacy Kit for Apple II Computers (TALK II)
(continuing)

Purpose: To provide an introductory set of speech-accessible computer software and related materials for any of the current Apple II family of computers which could be easily integrated into existing programs of computer literacy or introduction to computers for legally blind youth through adult beginners

Project staff: Debbie Willis, Project Director
Rob Meredith, Programmer
Fred Otto, Project Assistant
Venus Elder, Project Assistant

Background. During the fall and winter of 1985, the Talking Apple Literacy Kit (TALK): //e Edition was in the production pipeline of APH. The product became available in September 1986. In response to requests from the field, APH offered sets of the Brailled Keyboard model for the Apple //e, a component of the TALK, as a separate item.

At the Fifth Microcomputer Advisory Committee Meeting, a revision of the kit to include all current Apple II computers received high priority. Work on two components of the revised kit, the Brailled Keyboard Overlay for the Apple IIGS(R), and the disk introducing the keyboard, word processing, and games was started. The introductory word processing program, introductory games, and keyboard practice were programmed for speech and large print output to the screen. The program was named LetterTALK+. Documentation to accompany the disk was drafted. The program was reviewed in-house several times and underwent many changes.

Work on the Brailled Keyboard Overlay for the Apple IIGS also continued. Prototypes of the overlay were developed, checked for accuracy, tested for legibility, and a brief supplement to accompany the product was written. After some revisions, the materials were completed and turned over to production. It was decided to offer LetterTALK+ and the Braille Keyboard Overlay for the Apple IIGS as separate products from the kit. The overlays were produced and are being sold separately from the kit in packages of five.

During FY 1990, the draft of the documentation for LetterTALK+ was expanded to include "Extension Activities." Review of LetterTALK+ by in-house staff indicated problems related to the speed settings for the operation of the programs on the disk and several other major operational changes were needed. LetterTALK+ was used at the Kentucky School for the Blind during its summer enrichment program. Several problems were discovered as a result of the students' use of the program.

An extensive list of changes was sent to the programmer early in FY 1991. Due to personal time constraints, the programmer was unable to work on the necessary changes during the entire fiscal year. A draft of the documentation to accompany LetterTALK+ was written, but could not be finalized until the software is in its final stages of completion.

The software disk entitled APH Presents the Talking Apple was reprogrammed to convert the modules over to ProDOS, to reorganize the source code for current editors in use, and to make the program recognize the wider variety of Apple II computers currently available. This program was updated to include features of the Apple IIGS, new features of TEXTALKER, and suggestions from the field.

APH Presents the Talking Apple underwent additional programming changes to make it compatible for use with the Slotbuster and DoubleTALK. After these and several operational programming changes, APH Presents the Talking Apple received several in-house reviews. A draft of the updated and expanded teacher's manual was written; the final form it takes will depend on the final versions of the software and comments from reviewers.

Work during FY 1992.

APH PRESENTS THE TALKING APPLE COMPUTER

A list of needed modifications was compiled based on several in-house reviews. Many improvements were made to the program. Careful consideration was given to program content and structure. Various features related to these were reorganized and sections were rewritten as needed.

Other changes were of a textual nature. These included grammar and punctuation changes, reordering of sentences, and rewording options, explanations, and reinforcers.

As recommended by members of the Eighth Microcomputer Advisory Committee (to include appealing features wherever possible and appropriate in APH's talking software), one new feature added was the use of sound in some parts of the program. This allows short tunes to be played for reinforcement.

Another new feature incorporated was the disabling of CONTROL-C. Because most of APH Presents the Talking Apple Computer is written in BASIC, it was possible for the learner to press CONTROL-C in order to stop the program. The use of only CONTROL-C was changed, however, because the

program is targeted to new users, to include the use of any key to stop the program. Extensive testing was performed throughout the reprogramming process.

Due to consumers' request to make the original APH Presents the Talking Apple selection available independent of the total kit, it was decided to offer APH Presents the Talking Apple Computer as a separate product as well as a component of TALK.

Programming changes to APH Presents the Talking Apple Computer were completed. A User's Manual to accompany the software was drafted, edited, and a large type camera-ready master was prepared.

After final in-house reviews, all the necessary changes were made, and a production document was prepared. APH Presents the Talking Apple Computer was turned over for manufacturing.

LETTERTALK+

LetterTALK+ was turned over to a new programmer. Completion of this program has been a top priority.

COMPUTER PARTS COLLECTION

The computer parts collection was reviewed in light of currently available technology. It was decided to include a sample of a compact disk, a 3 1/2" disk, and a hard disk for a hard drive (if the hard disk does not add significantly to the cost of the kit). Sources and prices for nonworking samples of the additional components under consideration were obtained.

Work planned for FY 1993.

APH PRESENTS THE TALKING APPLE COMPUTER

APH Presents the Talking Apple Computer will be produced and made available as a separate product during the first half of FY 1993. When available, it will include 5 1/4" and 3 1/2" disks. Each disk will contain both the program and the User's Manual, with a manual reading program provided. Large type and recorded versions of the manual will also be packaged with the disks.

The software is for use with the Apple II family of microcomputers having at least 128K of memory, a 5 1/4" or 3 1/2" disk drive, and an appropriate speech synthesizer. It is designed to operate appropriately with an Echo, Cricket, SlotBuster, or DoubleTALK speech synthesizer.

Later in FY 1993, APH Presents the Talking Apple Computer will be included as a component of the Talking Literacy Kit for Apple II Computers.

LETTERTALK+

LetterTALK+ will be reviewed in-house. A list of "bugs" and necessary changes will be given to the programmer. Once the software is in its final form, the documentation to accompany the disk will be revised, edited, and a final draft prepared. Reference sheets to accompany the documentation and software will also be prepared. The total program will then be evaluated by outside consultants. After necessary modifications have been made, LetterTALK+ will have a final in-house review and then be prepared for production as a separate software program as well as a component of TALK II.

TEACHER'S MANUAL

After the software selections are completed, the teacher's manual can be updated and finalized, and a camera-ready master produced. The revised manual will also be recorded.

COMPUTER PARTS COLLECTION

A final decision on parts to include in the collection will be made.

TOTAL KIT

The entire revised kit will be evaluated by two consultants. After any essential revisions and a final in-house review, the Talking Literacy Kit for Apple II Computers (TALK II) will be turned over to production.

Textalker (completed)

Purpose: To incorporate features specifically recommended by blind users into the Textalker software and to set standards for use of speech synthesis on the Apple II

Project Staff: Larry Skutchan, Systems Programmer
Rob Meredith, Programmer

Background. Textalker is the software that works with the Echo synthesizers to provide the Apple with synthesized speech. It was written by Street Electronics Corporation. Members at the Third Microcomputer Advisory Committee Meeting recommended the program be modified to more accurately reflect the needs of the blind user and to help set standards for talking software. With the cooperation of Street Electronics, several improvements were added to the system that both enhanced productivity and increased ease of use. APH's initial version of Textalker was released as version 3.1.1. Later, APH added the ability to make many off-the-shelf applications work with speech on an Apple IIgs. This version was called Textalker-gs, making two different versions of the program--Textalker for older Apple II computers as well as the Apple IIgs and Textalker-gs for use only with the Apple IIgs.

Work during FY 1992. Several significant changes were made to both versions of Textalker.

Several minor problems were corrected and several parts of the code were optimized. Some new features and commands were also added to Textalker-gs. Some of these were as follows: installed a Read Inverse only command, improved cursor tracking, enhanced Character Monitor Mode, installed Park Mode which lets the user "park" the reading cursor in one place and leave it there for future reference, changed the means of redefining the command character, freed up some zero page locations, installed a new Line Monitor feature which lets the user hear a line when it changes, added a number processing routine to Textalker-gs that lets the user hear strings of digits as numbers, added commands to tailor how numbers get spoken, added a prefix function which permits more commands, added several commands for quicker maneuverability around the screen, added TAB to count as one of the keys to announce inverse when in Inverse Announcing mode, modified to function with ProDOS 2.0, added a Read Whole Screen command, added additional support for terminal software, added special support for the Quicken program to recognize that program's use of "special" cursor locations, installed a Find command in Review, and added an invalid command warning bell to let the user know when an incorrect command was used.

Textalker also received several modifications. Support for the new Echo LC was added, and the new improved features of the review mode in Textalker-gs were added to Textalker. Textalker also received the improved pronunciation rules and shortened punctuation pronunciation rules already found in Textalker-gs. Finally, the ProDOS version of Textalker got the number processing algorithm recently installed into Textalker-gs. (The number processor will not fit into the DOS 3.3 version, but that version still contains all the other features of Textalker 3.4).

Work planned for FY 1993. Work for this project is complete. Modifications and enhancements will continue as needed. The microcomputer group will also release both Textalker and Textalker-gs as disk only products to address the needs of the user that wants to upgrade to the newest version without the expense of all the manuals that come with the original product.

TEXT2000 (new)

Purpose: To provide software to access textbooks in a electronic format

Project staff: Larry Skutchan, Project Director
Rob Meredith, programmer
Debbie Willis, Research Scientist
Venus Elder, Research Assistant

Background. With the passage of the Americans with Disabilities Act and legislation in several states requiring publishers to make electronic versions of textbooks adopted by that state available to blind students, APH expects a dramatic increase in the number of textbooks available. While it would be impossible to braille all but the most needed titles, APH can supply vastly more books in electronic format that the student can then use with a computer and speech synthesizer, large print, or refreshable braille.

Work during FY 1992. APH examined several programs used for accessing electronically stored text in an effort to find one that would provide ease of use and flexibility with a variety of access equipment and still let the student retain the pagination of the printed book. A program called The Reader Project was identified as a tool that met many of these requirements. The Reader Project was tested and APH entered an agreement with the program's manufacturer for use of the program with some modifications for APH's specific needs. This program is called Text2000.

The staff realized that Text2000 is not ideal for all requirements, but the program would serve nicely until something that more closely matched APH's specific requirements can be identified or developed. One requirement of particular interest, not currently supported by Text2000, is the ability to run on Apple II and Macintosh as well as IBM and compatible machines. Other requirements include bookmark capabilities, support for writing notes associated with the text, searching, the ability to import text from standard publisher files, and the ability to display graphics. While Text2000 does not currently fulfill all these requirements, it should prove an effective tool for delivering textbooks while the staff gathers more information.

The Microcomputer Group field tested Text2000 at several locations including the Kentucky School for the Blind, the Indiana School for the Blind, and the Louisiana School for the Blind to determine its usefulness. The field testers found both very positive response and some concerns. One concern came when the field testers realized that some of the students were not familiar with their access tools. Several students expressed the need for a search capability, and others found the lack of

notification when the program tried to run on a machine with less than minimum requirements in terms of RAM.

The microcomputer group began coding an alternative delivery system for electronic text that will provide the capabilities of Text2000 with some additional functions. This project is called Text2020. While coding is in the early stages, some of the features that prompted the need for a whole new product include the ability to read files from nearly any origin, as opposed to only those files created especially for Text2000. APH feels that Text2020 could become the chosen delivery method for electronic text in a variety of formats, including books from Recording for the Blind, and manuals that already exist from shareware authors.

So far, Text2020 contains only the crude beginnings of a reading tool, but a complete redesign does permit the microcomputer group to design the tool from the beginning with special needs in mind. One feature not in the previous version, lets the user move through text a line at a time in either direction. This and the ability to page back through the material should prove welcome enhancements.

Work planned for FY 1993. Work will continue field testing and collecting information from users of Text2000. Coding will continue on Text2020. Testing of Text2020 should begin in the fall, and porting a version over to the Apple II platform is in the plans for this year. Routines that remain to be written include translators for varying file types, installation of locking mechanism for the protection of those publishers that require it, searching algorithms, graphics viewing capabilities, and more.

Typing Program for IBM (new)

Purpose: To provide students and teachers with appropriate software and documentation for use in teaching and reinforcing typing skills using IBM and compatible computers with speech output capabilities

Project staff: Larry Skutchan, Project Codirector
Debbie Willis, Project Codirector
Rob Meredith, Programmer
Benjamin Gurevich, Programmer
Venus Elder, Project Assistant
Fred Otto, Project Assistant

Background. As recommended by several Microcomputer Advisory Committees, the Kids Can! Typer was adapted by the Microcomputer Group for speech access. The talking version, Talking Typer, for use on Apple II computers, became available from APH in January 1991.

Members of the Eighth Microcomputer Advisory Committee assigned a high priority to developing a typing program similar to Talking Typer for use on IBM and compatible computers. They recommended that an additional teaching component with information on correct posture and fingers to use to type particular characters be included.

Work during FY 1992. The microcomputer group examined several titles currently available to determine the actual need for the project. (If an existing program could be used or modified, that program would be used.) Unfortunately, a typing tutor is one of those programs that do not work well when speech is added. The problem is that the speech output must be very selective during the typing drills. This means the program will need to be developed internally.

Work planned for FY 1993. The microcomputer group will begin coding for an IBM edition of a typing program.

Other Activities

Hand-held Scientific Calculator (new)

Purpose: To provide a talking hand-held scientific calculator with a large print display for use by legally blind high school students and adults

Project staff: to be determined

Background. A high priority was placed on the adaptation/development of a talking, hand-held, scientific calculator by the Seventh Microcomputer Advisory Committee. The Eighth Microcomputer Advisory Committee supported this position by noting that such a device was "desperately needed."

Work during FY 1992. Members of APH's research staff have been in contact with Tim Cranmer of the National Federation of the Blind's (NFB) research committee to keep track of that organizations progress in developing a talking, hand-held, scientific calculator. Additionally, Kenneth Jernigan, of NFB, and Jack Decker, of APH, talked regarding APH manufacturing and distributing this product. Dr. Cranmer received a working prototype (breadboard model) in March of 1992.

Work planned for FY 1993. At the time NFB completes its initial development of this product, APH will bid on manufacturing and distributing the product. A precedent for this was established with the Speaqualizer. Production engineering will be the responsibility of APH's Technical Research Division.

1992 Survey of Ex Officio Trustees (Series)

Purposes: To obtain information for APH (a) regarding needs for materials and (b) for administrative purposes

Project staff: June Morris, Project Director
Venus Elder, Project Assistant

Background. Periodically, ex officio trustees have been queried about timely topics (e.g., specific textbook needs, specific needs for special teaching materials, preferred days for Annual Meeting, resources for purchasing educational materials, information on minimum competency testing in their states/agencies, etc.).

Work during FY 1992. A survey was conducted in the spring of 1992 similar to those conducted in the springs of 1989 and 1990 regarding APH's products and services.

Using the format of the 1990 survey, a slightly revised questionnaire was created to gain feedback from current ex officio trustees concerning APH products and services. An additional segment was added addressing the six national education goals of the AMERICA 2000 education strategy as it relates to blind and visually impaired students.

With the assistance of fellow Educational Research personnel, the Magazine Circulation and Program Support Departments, and a member of the Advisory Services Department, the updated 1992 Questionnaire was mailed to current ex officio trustees. A database was created and information was entered as the questionnaires were received in preparation for the composing of a final report.

Work planned for FY 1993. A formal report will be written utilizing data gathered from the 88 returned questionnaires. A separate report compiling information addressing the six AMERICA 2000 education goals, as they relate to blind and visually impaired students, will be written. Ex officio trustees will be surveyed in the future for input on issues and concerns as needs arise.

Development of Guidelines for Literacy: Selecting Appropriate Learning Media (completed)

Purpose: To develop a set of guidelines/criteria to assist teachers in selecting the primary reading medium or media for visually impaired students with some remaining vision

Project staff: Hilda Caton, Project Director
Eleanor Pester, Project Associate Director

Background. At the present time, a great deal of attention is being given to the overall question of developing literacy in visually impaired children. Literacy, the ability to read and write, is a prerequisite to communicating appropriately, competing effectively, and ultimately, attaining success in life. Many persons, both consumers using braille and service providers who teach or produce materials themselves have become concerned that the number of braille readers and writers in the United States is decreasing and they believe that many visually impaired children are not receiving adequate (or any) instruction to aid them in becoming truly literate adults. In particular, it appears that many children who have some remaining vision are not being provided the opportunity to learn braille. Guidelines are needed for the selection of appropriate learning media for visually impaired children who do not fit neatly into the categories of braille or print users. Obviously students with mild vision losses will use print and students who are totally blind will use braille.

APH's Educational Research and Development Committee requested APH bring together national experts in this area to develop a set of guidelines, or criteria, to assist teachers, parents, paraprofessionals, and others who are directly responsible for determining which children should use braille as their primary learning medium. Also, the guidelines will address when the instruction in braille for children with degenerative eye conditions should begin.

A committee meeting was held at APH on June 8-9, 1990, to develop the guidelines. The decision had been made to write and publish the set of guidelines if a consensus was reached at the meeting and, if no consensus was reached, a detailed report of the meeting would be published.

A set of guidelines was initially drafted at this meeting, then put together, and sent out to the committee members for review. Revisions were made based on the comments received and the document was once again sent out for review. A final draft was developed following this final review. The document was entitled Print and Braille Literacy: Selecting Appropriate Learning Media and contained information pertaining to the major

principles which should be understood, suggested areas for assessment and evaluation, and guidelines for decision making in the selection of a learning medium or media for visually impaired children. In addition, it provided annotated bibliographies of selected resources, references, statistical data, a list of functional vision assessment instruments, and other information related to this critical problem.

Work during FY 1992. The final draft of this document was completed and published in time for Annual Meeting in 1991.

Tools for Selecting Appropriate Learning Media (new)

Purpose: To expand the assessment section (Section II) of the document entitled Print and Braille Literacy: Selecting Appropriate Learning Media which was developed at APH by a group of experts in the ares of print and braille literacy

Project staff: Hilda Caton, Project Director
Eleanor Pester, Project Codirector

Background. On June 8-9, 1990, a committee of experts in the field of education of visually impaired children met at APH to develop a set of guidelines to assist teachers of visually impaired students in selecting the appropriate learning media/medium for their students. The resulting document is entitled Print and Braille Literacy: Selecting Appropriate Learning Media and is published by APH. This document does not contain specific, detailed assessment procedures. Instead, it contains general guidelines to assist teachers and other professionals in making decisions about learning media. Members of the committee who developed the guidelines felt that it was necessary to expand them and to develop specific assessment procedures for determining the appropriate learning media/medium for individual students. In order to accomplish this, a planning committee was formed to draw up specifications for this project. Committee members were:

Sr. Margaret Fleming, Teacher, St. Lucy Day School, Philadelphia, Pennsylvania
Mrs. Ruth Holmes, Retired Low Vision Specialist, Illinois School for the Visually Impaired and the State of Illinois, Jacksonville, Illinois
Mr. Fred Schroeder, Director, New Mexico Commission for the Blind, Santa Fe, New Mexico
Dr. Susan Spungin, Associate Executive Director, American Foundation for the Blind, New York, New York
Dr. Robert Winn, President, The Hadley School for the Blind, Winnetka, Illinois
Dr. Diane Wormsley, Director of the Western Regional Center, American Foundation for the Blind, San Francisco, California

Work during FY 1992. The committee met at APH in August of 1991 and outlined an expanded version of Section II of Print and Braille Literacy which will include specific assessment procedures and instruments for each part of that section. Members of the planning committee assisted in writing these sections.

Work planned for FY 1993. The first draft of the sections written by committee members will be edited, revised, and sent to the full committee for review. Based on the committee review of the first draft of this document, the material will be revised and expanded as necessary. Additional experts will be asked for contributions in writing or will be added to the committee as needed. The final document is expected to be a companion to Print and Braille Literacy: Selecting Appropriate Learning Media on specific assessment procedures and instruments for selecting the appropriate learning media.

APH Portable Plus User Survey (completed)

Purpose: To determine (a) how the player is used and (b) what customers think of it

Project staff: June Morris, Project Director
Darlene Donhoff, Project Assistant

Background. APH has been aware of a design feature of the APH Portable Plus Record Player that could pose a minor problem for users. Additionally, APH was aware of a limitation in the tonal range that some users might notice. However, a search of repair records did not disclose that either of these potential problems had resulted in returns of the players for "repairs." In the fall of 1991, it was suggested by APH's production personnel that individuals who were using the player be surveyed to determine how they were using it, what features they used, and what they thought of the player.

Work during FY 1992. A questionnaire was designed and tested querying how the player was used, what was liked about it, what the user would like changed, and if there had been any problems with it. These questionnaires were sent to all individuals who had purchased the players within a specified period of time. This excluded those who had purchased the first run--after which a correction was made to the case--and anyone who had not had the player for at least 6 months. The questionnaires were mailed on February 25, 1992, and were to be returned by the end of March. Eighty-four percent of them were. Tabulation of the results provides information for future modifications of this player as well as providing information about use of the various special features that are incorporated in this device.

Student Atlas and Tactile Graphics (new)

Purpose: To provide generic tactile graphics common to precollege textbooks

Project staff: David Bice, Project Director

Background. APH has developed specialized equipment for producing tactile graphics in paper, the output of which has been empirically tested and proven to be legible for persons reading the graphics tactually. This equipment has been used to make the plates for graphics appearing in APH's braille books. Recently, there has been a reemergence of interest in geography and maps for use educationally and personally. In response to this need, APH has increased its production capability for making tactile graphics and planned, for Fall 1992 release, a world atlas. This atlas is being developed as part of APH's Century Series; a series of popular books being produced in braille for which APH is underwriting most of the production cost. This has been made possible through APH's fund raising efforts. Some descriptive information is included with each of the 36 maps comprising this atlas.

Work planned for FY 1993. A student atlas is planned based on the world atlas, to be distributed as part of APH's Century Series. The student atlas will contain the same tactile maps as the Century Series atlas, but will have additional descriptive and instructional information making it suitable for student use. By using the same maps as in the other atlas, cost of manufacture (and end price to the customer) will be greatly reduced.

Other work is planned in which packets of graphics to accompany a number of subject areas will be developed for use with the Nomad. This device contains a high resolution touch sensitive pad, including various electronic and electrical assemblies, and a voice synthesizer. Tactile graphics can be placed on the touch pad, which is connected to a computer, and information about the graphics entered into the computer and stored in a named file. Once a graphic and its accompanying data file have been created, blind students can study the graphic independently receiving preprogrammed audio instructions and/or information via the voice synthesizer. Possible subject matter includes geography, geometry, biology, physics, etc.

Technical Research Division

Technical Research Division

Purpose: To develop products involving technology and to introduce other new products for production

Division staff: Bob Phelps, Manager
James Robinson, Manufacturing Specialist
Frank Hayden, Manufacturing Specialist
Darlene Donhoff, Technical/Clerical Assistant

Background. For many years APH personnel from the Research and New Products departments worked closely together in the development of electronic and other technological products and in transforming experimental prototypes of new products into manufactured goods. Because of this close relationship, in January 1989 an organizational change was made in which the New Products Department became the Technical Research Division of the Department of Educational and Technical Research (previously the Department of Educational Research).

Every new product initiated by Educational Research staff or by other areas of APH requires making a bill of materials, constructing raw material numbers, locating vendors, developing manufacturing procedures for items making up the product, calculating lead times for manufacturing, assigning work orders, and doing other associated preproduction and production tasks. Some require artwork for new tooling processes. When making revisions, old stock is depleted or pulled and replaced with new. Production manuals are developed for new products and revised for products that are changed. These constitute the daily nuts and bolts of the Technical Research Division operations; in addition, the following briefly describes specific projects addressed by this division:

Work during FY 1992.

AC/DC Rechargeable 4-Track Cassette Tape Recorder/Player--Redesign (continuing). The "Use and Care Guide" was developed for the cassette version. Communications was initiated to find a solution for a problem with the speaker. All of the old model have been sold. A new brochure has been completed

APH Multiple Headset Adaptor (continuing). A prototype was shown to various employees at APH and everyone was impressed by it. Twenty units were built and given to members of APH's Consumer Product Evaluation Committee to use for evaluation purposes.

APH PocketBraille (discontinued). It was decided to no longer manufacture the PocketBraille. However, an update to correct some "bugs" was completed. All incoming repairs will be updated if the owner so desires. The update changes operational procedures, necessitating the revision of the manual. The large type edition was completed and the braille edition was in process.

APH Portable Plus (completed). The repairs manual was completed and the responsibility for repairs of the Portable Plus units was turned over to Electronic Repairs. The Technical Research Division still lends a hand when the need arises. A survey was designed and sent out to Portable Plus owners. A report with graphs was compiled from returned surveys, making comparisons of likes/dislikes, suggested improvements, etc.

AppleWorks Manuals (completed). This latest software program was put into production and completed. A new brochure was designed and mailed out.

Bright Sights Kit - Puppet Redesign (continuing). The Technical Research Division worked on designing a hand puppet that could be ordered or made in-house. This eliminates the ever constant problem of ready-made items becoming discontinued and having to find suitable replacements. A puppet was designed and approved. A vendor was found who was willing to manufacture the puppet. The first order received looked acceptable; a second order was unacceptable as the silk-screened features peeled off. Project staff are looking into having the features sewn on with an application process.

Circuit Board Room (completed). Additional work was done in the circuit board room to make up boards for the APH Multiple Headset Adaptors. Members of APH's Consumer Product Evaluation Advisory Committee evaluated these.

Constructo Set Supplement (completed). All work was completed on this kit and it was put into stock. A new brochure was completed.

Digital Audio Project (continuing). The Division has converted two more analog titles to digital for the National Library Service for the Blind and Physically Handicapped.

Embossed Graph Sheets (completed). This was completed and put into stock. A brochure was designed for this new product.

G.E. Patchcord Kit (continuing). This continues to be on hold for future consideration.

Hands On Kit (completed). This kit was completed and put into stock. A brochure has been designed and finished. This kit started a new practice of having the urethane tray in the kit both made and painted by the vendor, eliminating the need of painting it in-house.

Individual Calendar Kit (completed). This kit was completed and put into stock. A new brochure was designed which combines all calendars produced into one brochure.

Large Textured Block (completed). A new vendor was located who was willing to make the parts at the same cost and in the quantities needed.

On the Way to Literacy: Early Experiences for Visually Impaired Children (continuing). All materials ordered for these books have been received. Tooling has been completed. Work began for the sewing parts on these books. All artwork changes were completed and the plates made. Work began on the print/braille pages and color/print pages.

Over the Ear Headphone (continuing). No definite decision has been made on whether or not to proceed with this new product.

Portable Sound Source II (completed). A new, stronger type of switch was implemented as a replacement for the current one. The new switch should not jar on during shipment as the old one did.

Recognizing Landforms (continuing). Work began on revising the way this is manufactured. Screens were made allowing the maps to be silkscreened and then vacuumformed. This eliminates the hand painting, which is costly and time consuming, and makes for a vast improvement in the quality. A complete run can be silkscreened in about the same time it would take to do hand painting for just one set.

Revised Parts Lists (continuing). The parts lists for products are being revised as each comes up for production. All new kits are having their parts lists set up according to the current procedures.

SEI Manuals - Revisions (completed). The SEI manuals were revised so a generic one could go in all software programs, eliminating the need to make different versions for each of the software programs.

Sensory Pad (continuing). A vendor has provided several samples for evaluation purposes. Work continues with the making of field testing samples.

Shoelace Aid (continuing). Revisions were made on this kit and approved. New tooling was devised, ordered, and received. The new design greatly reduces the cost. The old stock will be depleted before the revised shoelace aid is distributed.

Shipping Cartons (continuing). There has not been any new progress on this.

Silk-screen Process (continuing). Silkscreening continues to be done as kits with silkscreening are scheduled for production. For the Hands On Kit the polyblend covers were silkscreened, a first time for using this type of material. It worked well and was completed in the fastest time ever. Several people have been trained in the silkscreen area and others are expressing interest in learning the procedures. New inks and clean-up products have been tried and some have been put into use, making the screening processes better and faster.

Sleep Switch (discontinued). A decision was made not to pursue this project.

Variable Intensity Study Lamp (continuing). Lamp bases and base plates were ordered and received. The bases were sent to be drilled and painted, but had to be sent back three times for corrections. One production run of about 170 lamps was completed. This will be all until the new UL approved lamp head is received, allowing the lamp to get UL approval.

Work planned for FY 1993. In addition to the development of new products, implementing first production runs, and finding solutions for other departments when problems arise, definite plans are in place for the following:

APH Multiple Headset Adaptor--produce a prototype sample for approval and implement the first production run of the redesigned unit

APH Presents the Talking Apple® Computer--implement first production run

Digital Audio Project--work on projects as they come in

Impressor

NOMAD Graphics Pad

On the Way to Literacy--complete first production run, and start on three additional tactile storybooks

Painting (in-house)--eliminate the need to do in-house painting whenever possible

Parts Orders--implement a plan to fill replacement or extra parts orders

Pocket Notebook 3 1/2 x 5 in.--implement first production run

Recognizing Landforms--continue to work towards having the kit silkscreened as opposed to hand painted and implement the first production run

Sensory Pad--continue work on the design and work toward future production

Sewing--look at the feasibility of doing sewing in-house to have greater control of quality and quantity

Shoelace Aid--implement first production run of the redesigned shoe

Textalker--facilitate revisions

TEXT2000

Variable Intensity Study Lamp--implement first production run of the redesigned lamp

Agencies Participating in Research

In addition to the agencies named here, appreciation is also extended to the many other agencies which cooperated with APH's research efforts by permitting members of their staffs to serve as consultants or respondents to requests for information.

American Council of the Blind; Washington, DC
Apple Computer, Inc.; Cupertino, California
Carr School; Lincoln Park, Michigan
Children's Center for the Visually Impaired; Kansas City, Missouri
Claris Corporation; Mountain View, California
Cooperative Preschool for Visually Impaired Children; Phoenix, Arizona
Crayton Middle School; Upper Darby, Pennsylvania
Foundation for Blind Children; Scottsdale, Arizona
Great River AEA-16; Burlington, Iowa
High Expectations Software; Lexington, Kentucky
Indiana School for the Blind; Indianapolis, Indiana
International Business Machines Corporation; Louisville, Kentucky
Jefferson County Public Schools; Louisville, Kentucky
Kentucky Department for the Blind; Frankfort, Kentucky
Kentucky School for the Blind; Louisville, Kentucky
Louisiana School for the Visually Impaired; Baton Rouge, Louisiana
National Federation of the Blind; Baltimore, Maryland
National Federation of the Blind, Research and Development; Louisville, Kentucky
New Mexico School for the Visually Handicapped, Preschool Program; Albuquerque, New Mexico
Overbrook Educational Center; Philadelphia, Pennsylvania
RC Systems; Bothell, Washington
Reader Project, Inc.; Washington, DC
St. Lucy Day School; Upper Darby, Pennsylvania
Street Electronics Corporation; Santa Barbara, California
Texas School for the Blind and Visually Impaired; Austin, Texas
University of Louisville, Perceptual Alternatives Laboratory; Louisville, Kentucky
Wood County Board of Education; Bowling Green, Ohio

Consultants

In addition to the consultants formally acknowledged in this section, appreciation is extended to the many individuals who have willingly given of their time and expertise in cooperating with the various research and development projects underway by responding to questionnaires, by answering less formal queries for information, and by working with research staff in countless ways such as: (a) identifying particularly talented teachers and other professionals to serve on committees and/or as expert reviewers; (b) recommending programs, teachers, and students appropriate for field evaluation sites; and (c) facilitating field evaluation efforts. Only through the splendid and continuing support of professionals working in the field and the people they serve is APH able to maintain its highly effective research and development program.

Adult Braille Writing

Ms. Deanna Scoggins, Primary Teacher, Kentucky School for the Blind, Louisville, Kentucky

Braille Language Program

Teacher Evaluators

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Mr. Ted Lennox, Teacher of the Visually Impaired, Carr School, Lincoln Park, Michigan

Ms. Deborah Mason, Primary Teacher of the Visually Impaired, Overbrook Educational Center, Philadelphia, Pennsylvania

Mrs. Mary Powers, Teacher of the Multihandicapped, Crayton Middle School, Columbia, South Carolina

The Braille Research Center

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Dr. Philip H. Hatlen, Superintendent, Texas School for the Blind and Visually Impaired, Austin, Texas

Dr. Dean Tuttle, Associate Professor, University of Northern Colorado, Greeley, Colorado

Dr. Robert J. Winn, President, The Hadley School for the Blind, Winnetka, Illinois

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Dr. Yvonne Howze, Superintendent, Missouri School for the Blind, St. Louis, Missouri

Mr. Andrew S. Papineau, State Consultant, Wisconsin Department of Public Instruction, Madison, Wisconsin

Ms. Suzanne G. Swaffield, Consultant, Visually Handicapped, South Carolina Department of Education, Columbia, South Carolina

Dr. Richard L. Welsh, President, The Greater Pittsburgh Guild for the Blind, Bridgeville, Pennsylvania

Dr. Robert J. Winn, President, The Hadley School for the Blind, Winnetka, Illinois

Infant Skills Project

Teacher Evaluators

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Mrs. Diane Rodger, Vision Itinerant Teacher, Columbia Region 6, Portland, Oregon

Mrs. Mary Zabelski, Vision Itinerant Teacher, Chicago Lighthouse for the Blind, Chicago, Illinois

Making Picture Recipes

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Mrs. Lelia Morel, Special Education Teacher, Jefferson County Public Schools, Louisville, Kentucky

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Multihandicapped Adolescent Project

Mrs. Jackie Brennen, Supervisor of Life Skills Program, Overbrook School for the Blind, Philadelphia, Pennsylvania

Ms. Mary Jane Brown, Program Administrator, Multihandicapped Program, New York Institute for Special Education, New York, New York

Mrs. Diane Haynes, Early Childhood Teacher, Deaf-Blind Intervention Project, Lexington, Kentucky

Ms. Martha Majors, Assistant Supervisor, Deaf-Blind Program, Perkins School for the Blind, Watertown, Massachusetts

Mrs. Mary Zatta, Teacher, Deaf-Blind Program, Perkins School for the Blind, Watertown, Massachusetts

On the Way to Literacy II

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Dr. Josephine Stratton, EdD, Norwich, New York

Penny Tate, Preschool Teacher, Children's Center for the Visually Impaired, Kansas City, Missouri

Parent Early Childhood Education Series

Dr. Natalie Barraga, Professor (Emeritus), University of Texas, Austin, Texas

Dr. Vivian Correa, Professor, University of Florida, Gainesville, Florida

Dr. Verna Hart, Professor, University of Pittsburgh, Pittsburgh, Pennsylvania

Dr. Bernadette Kappen, Associate Director, Overbrook School for the Blind, Philadelphia, Pennsylvania

Preschool Learning Activities

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Mrs. Katherine Robinson, Teacher/Director, Montessori Program, Coleridge-Taylor Elementary School, Jefferson County Public Schools, Louisville, Kentucky

Teacher Evaluators

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Mrs. Pauletta Feldman, Parent, Louisville, Kentucky

Ms. Julie Founder, Teacher, Alabama School for the Blind, Talladega, Alabama

Ms. J. Greeley, Teacher, Anchor Center for Blind Children, Denver, Colorado

Ms. Sandra Handy, Teacher, Utah School for the Blind, Ogden, Utah

Ms. Barbara Hatfield, Teacher, Utah School for the Blind, Ogden, Utah

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Ms. Kathy Peterson, Teacher, New Mexico School for the Visually Handicapped Preschool, Albuquerque, New Mexico

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Mrs. Kathy Scott, Vision Supervisor, Capital Area Intermediate Unit, Harrisburg, Pennsylvania

Mrs. Charlie Sirman, Teacher, Visually Impaired Orthopedically Handicapped Classes, DeKalb County School System, Atlanta, Georgia

Ms. Rose Anna Stillwagon, Evaluator, Capital Area Intermediate Unit, Camp Hill, Pennsylvania

Ms. Ann Timfhenka, Teacher, Capital Area Intermediate Unit, Camp Hill, Pennsylvania

Mrs. Martha Waites, Teacher, Alabama School for the Blind, Talladega, Alabama

Summer Seminars

Print and Braille Literacy: Selecting the Appropriate Learning Media

Natalie Barraga, Professor Emeritus, University of Texas, Austin, Texas

Sr. M. Margaret Fleming, Teacher of the Visually Impaired, St. Lucy Day School, Upper Darby, Pennsylvania

Randall Jose, Optometrist, Houston Lighthouse for the Blind and University of Houston, Houston, Texas

Susan Spungin, Associate Executive Director, American Foundation for the Blind, New York, New York

An Individualized, Systematic Assessment of Visual Efficiency (ISAVE) for Children with Multiple Developmental Needs

M. Beth Langley, Educational Diagnostician, Pre-K Assessment Team, Pinellas County Schools, St. Petersburg, Florida

Tools for Selecting Appropriate Learning Media

Sr. M. Margaret Fleming, Teacher of the Visually Impaired, St. Lucy Day School, Upper Darby, Pennsylvania

Mrs. Ruth Holmes, Retired Low Vision Specialist, Illinois School for the Visually Impaired and State of Illinois, Jacksonville, Illinois

Mr. Fred Schroeder, Director, New Mexico Commission for the Blind, Santa Fe, New Mexico

Dr. Susan Spungin, Associate Executive Director, American Foundation for the Blind, New York, New York

Dr. Robert J. Winn, President, The Hadley School for the Blind, Winnetka, Illinois

Dr. Diane Wormsley, Regional Director, American Foundation for the Blind, West Regional Center, San Francisco, California

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Meredith, Rob	Programmer
*Moore, Sheri, EdD	Research Scientist
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Phelps, Bob	Manager
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Hamp, Eric, PhD
Langley, M. Beth, MS
Modaressi, Betty, BS

*part-time employees

Publications

Willis, D. H. (December, 1991). Enhancing blind students' typing skills using a computer with speech output. Conference Proceedings from the First World Congress on Technology for People with Disabilities, Volume V, Technology in Education: Part 2. Arlington, VA: United States General Services Administration.

PROGRAM MATERIALS

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Pester, E. J. (1992). Classroom calendar kit. Louisville, KY: American Printing House for the Blind.

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Sliwa, S., Willis D., & Skutchan, L. (1992). APH/SEI talking software user's manual. Louisville, KY: American Printing House for the Blind.

Willis, D. H., Meredith, R., & Otto, F. (1992). User's manual for APH presents the talking Apple® computer. Louisville, KY: American Printing House for the Blind.

Willis, D. H., & Skutchan, L. (1992). Getting started with your AppleWorks® computer. Louisville, KY: American Printing House for the Blind.

Presentations and Workshops

Moore, S. B. (1992, June). Materials for parents and teachers of young blind and multihandicapped visually handicapped children. AER International Conference, Los Angeles, CA.

Moore, S. B. (1992, June). Workshop on materials for the young and multihandicapped visually impaired student. Preview Statewide Training, Ashland, KY.

Pester, E. J. (1992, October). Print and braille literacy: Selecting appropriate learning media. Indiana Association for Education and Rehabilitation of the Blind and Visually Impaired Conference, Indianapolis, IN.

Willis, D. H. (1991, July). Enhancing typing skills using a computer and speech output. ConnSENSE '91: Technology for Individuals with Special Needs, University of Connecticut, Storrs, CT.

Willis, D. H. (1991, October). What's coming? A new classroom. Annual Meeting of Ex Officio Trustees, American Printing House for the Blind, Louisville, KY.

Willis, D. H. (1991, December). Enhancing blind students' typing skills using a computer with speech output. First World Congress on Technology for People with Disabilities, Technology in Education: Part 2, Arlington, VA.

Willis, D. H. (1992, April). You can read and write braille. Special presentation for Kentuckiana Girl Scout Troop #1395, Fern Creek Baptist Church, Fern Creek, KY.

Willis, D. H. (1992, July). Using current technology to enhance blind students' typing skills. AER International Conference, Los Angeles, CA.

Willis, D. H., & Skutchan, L. (1992, April). TEXT2000: An equal access reader program. Special presentation for Marjorie Ward's students from Ohio State University, American Printing House for the Blind, Louisville, KY.

Wright, S. (1991, October). On the way to literacy: Early experiences for visually impaired children. Annual Meeting, American Printing House for the Blind, Louisville, KY.

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New Products

AppleWorks Manuals: Special Editions
AppleWorks Tutorial: Recorded Edition
AppleWorks Reference Manual: Disk Edition

Braille Calendar for 1992--improved format

Classroom Calendar Kit

Embossed Graph Sheets--11 x 11 1/2 in.; 1/2 in. grid; margins on left, bottom, and top sides

Green Line Writing Paper--8 1/2 x 11 in.; 7/16 in. spacing; 3 holes

Hands On: Functional Activities for Visually Impaired Preschoolers

Individual Calendar Kit

Print and Braille Literacy: Selecting Appropriate Learning Media

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